SAMI
ADVANCED
ELECTRONICS
شركة الإلكترونيات المتقدمة

SAMI-AEC Masseh

Maximizing Security Screening Efficiency in Saudi Arabia with Automated Under Vehicle Inspection

Table of Contents

Executive Summary

The growing adoption of cloud computing, artificial intelligence, and mobile technologies has led to the profound transformation of the physical security industry from a hardware-centric model to a value-centric hybrid of software and hardware technologies. It is safe to expound that the methods to achieve robust security are constantly evolving. Traditional physical security measures such as mechanical locks, protective barriers, and coaxial CCTV systems, are becoming obsolete. Thereby, organizations must adopt more advanced as well as automated solutions, ensuring accurate, infallible, and fast response actions.

For regions such as Saudi Arabia, characterized by a high influx of global tourists due to religious pilgrimages and tourism, a high density of mission-critical infrastructure, and a recent surge in large-scale events from sports to entertainment, the evolution of security technologies is particularly paramount. Now, with the implementation of Vision 2030 objectives, a plan for social and economic modernization, the Kingdom is restructuring its economic cities, building special zones, and investing for the future by unleashing promising new sectors. This necessitates robust physical security measures to ensure the safety of businesses, infrastructure, and people. Consequently, the Kingdom is poised to integrate avant-garde technologies such as Under Vehicle Scanning Systems (UVSS) into its security protocols and posture.

UVSS significantly bolsters security efforts by unveiling potential threats under the carriage of a vehicle, concealed from traditional security measures.

UVSS represents a significant breakthrough in security technologies, allowing for meticulous examinations of a vehicle's undercarriage, pinpointing potential threats hidden from plain sight. Such a proactive approach substantially elevates security measures, facilitating the swift identification and mitigation of risks.

Aiming to pioneer advanced security solutions in Saudi Arabia, SAMI-AEC, a leading regional security player, has designed an Under Vehicle Scanning System called SAMI-AEC Masseh. Locally manufactured in Saudi Arabia, SAMI-AEC Masseh comprises various sophisticated technologies such as AI-powered video analytics and 3D scanning that enable improved under-vehicle inspection. This ultimately strengthens security across the Kingdom's critical infrastructure, safeguarding its progress and creating a stable environment for investment and growth.

Evolving Physical Security Needs Necessitate Sophisticated Security Solutions

Effective physical security measures form an essential part of a comprehensive risk management strategy. By implementing a layered approach that includes access control, surveillance cameras, and intrusion detection systems, physical security aims to mitigate potential threats and minimize the likelihood of unauthorized access, damage, or theft. [1] Now, with the growing integration of physical systems with the cyber world, the physical security landscape is becoming more intricate, expanding the attack surface. This in turn creates new ways for bad actors to disrupt physical systems and jeopardize security of premises, personnel, or tangible assets. Consequently, it has become imperative for organizations to adopt advanced technologies and measures that successfully mitigate these evolving threats. [2]

Exploring the State of Physical Security in the Modern Era

83% of chief security officers (CSOs) predict that there will be a rise in physical security threats within the next year [4]

Almost 50% of CSOs confirmed a significant increase in physical security budgets in the next 12 months, owing to rising domestic security concerns, costs, and economic instability [4]

90% of CSOs agree that the integration of technology enhances the overall effectiveness of security operations, increasing the efficiency and productivity of security staff [4]

Tech-Driven Security

A Path to a More Prosperous Saudi Arabia

46% of Saudi Arabia organizations plan to adopt cutting-edge security solutions such as AI-powered surveillance and monitoring systems [9]

US$113.5 Million Anticipated valuation of Saudi Arabia's security market by 2028 [10]

Enhancing Security Measures in Saudi Arabia

A Focus on Physical Security

In Saudi Arabia, a robust physical security posture emerges as a critical enabler as the Kingdom charts its course toward a diversified and knowledge-based economy under Vision 2030.

Economic Development

For KSA, physical security extends beyond the protection of physical assets to foster an environment of trust and stability. This is essential to attract foreign investment and businesses as the Kingdom shifts its focus on diversifying the economy beyond oil. With the implementation of leading-edge advanced physical security solutions, Saudi Arabia can strengthen its position as a regional economic powerhouse.

Protecting Critical Infrastructure

As part of Vision 2030, Saudi Arabia has put increased focus on the development of infrastructure across its cities. [3] A high-tech and robust physical measure is essential to safeguard these facilities from theft, vandalism, or disruption, to ensure smooth operations.

Emerging Technology for Securing Saudi Arabia's Critical National Infrastructure

With a technology-driven approach, Saudi Arabia can create a robust defense framework, safeguarding the Kingdom's infrastructure for national security and economic prosperity.

Artificial Intelligence

Pioneering the Era of Visual Intelligence

74%

of security solutions developers concede to their firm's R&D investments being fully, heavily, or somewhat focused on AI [12]

39%

of security professionals reveal that AI-based video surveillance actively supports other business functions [14]

Artificial intelligence is revolutionizing the world of physical security, making security and solutions more intelligent and efficient. While there are numerous AI security applications, the camera seems to become its ultimate sensor. AI is tranvsforming video surveillance, changing its value proposition to visual intelligence. Furthermore, AI-based video surveillance is continuously advancing with potential applications including deep search of recorded content, and real-time video analysis. [12]

Cloud-Based Solutions for Effortless Security

77%

of security, facilities, and IT professionals project increased opportunities with cloud utilization for video surveillance purposes [14]

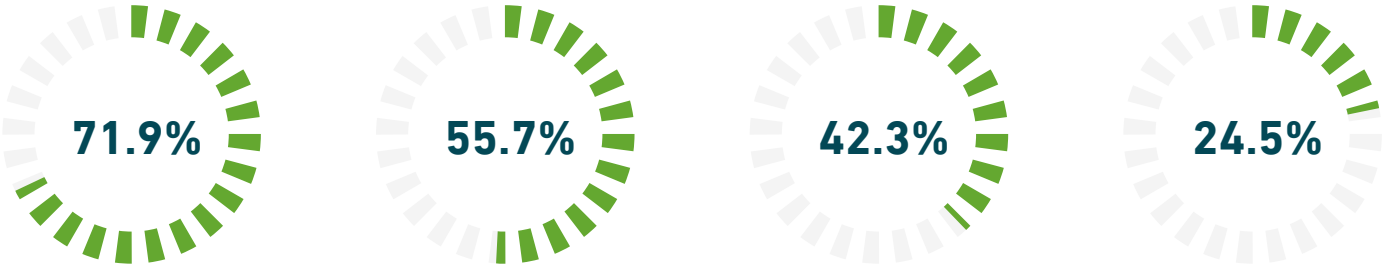
61.7%

Of organizations outright prefer cloud-based solutions over non-cloud [11]

Keeping pace with other industries, the physical security sector is also embracing cloud technology. Cloud-based video surveillance allows organizations the flexibility to upgrade and adapt if more cameras or storage are required. Moreover, professional teams monitor and maintain physical security applications, alleviating the burden on internal teams. [13]

Modernizing Security

Deployment Trends for Key Physical Solutions [11]



Access Control

Training and Awareness

Environmental Sensors

License Plate Recognition

% denotes organizations leveraging the above physical security solutions

License plate recognition technology is headed towards a future of increased accuracy and efficiency with enhanced recognition capabilities, and integration of AI and ML cloud-based solutions. It is rapidly reshaping physical security across premises by identifying thousands of plates per minute and cross-checking against arrest warrants. [5]

Bridging the Security Gap

Under Vehicle Surveillance Takes Center Stage

In conventional approaches, security has often prioritized the visible, neglecting the unseen dangers lurking beneath vehicles. Bridging this gap, Under Vehicle Scanning Systems (UVSS) represents a significant step forward, offering a new frontier in security.

Addressing Security Vulnerabilities

The Role of Under-Vehicle Inspection Systems in Comprehensive Security Strategies

Under Vehicle Scanning Systems are a complete game-changer in a layered security approach. These systems effectively strengthen traditional access control, video surveillance, and perimeter security measures, acting as a powerful deterrent against hidden threats. Consequently, organizations across the globe are increasingly utilizing Under Vehicle Scanning Systems (UVSS).

USD 12.8 Billion

Projected valuation of the global Under Vehicle Scanning Systems market by 2026, growing at a CAGR of 10.84% [8]

Fundamental Elements of UVSS

High-resolution cameras

Capture real-time images of the undercarriage of passing vehicles [7]

Sensors

Detect irregularities or foreign objects on the undercarriage [7]

Software algorithms

Analyze the captured images [7]

AI and video surveillance

Leverage advanced analytics for object detection and classification [8]

Diverse Types of Under Vehicle Scanning Systems [7]

These versatile systems can be tailored to specific organizations' requirements, providing a powerful tool for security personnel.

Fixed Under Vehicle Scanning Systems

- Permanently installed at entry and exit points
- Ensure continuous monitoring and inspection of vehicles
- Ideal for high-security areas that require constant vigilance

Portable Under Vehicle Scanning Systems

- Designed for temporary or mobile use
- Offer flexibility in deployment
- Suitable for conducting inspections across various sites

Integrated Under Vehicle Scanning Systems

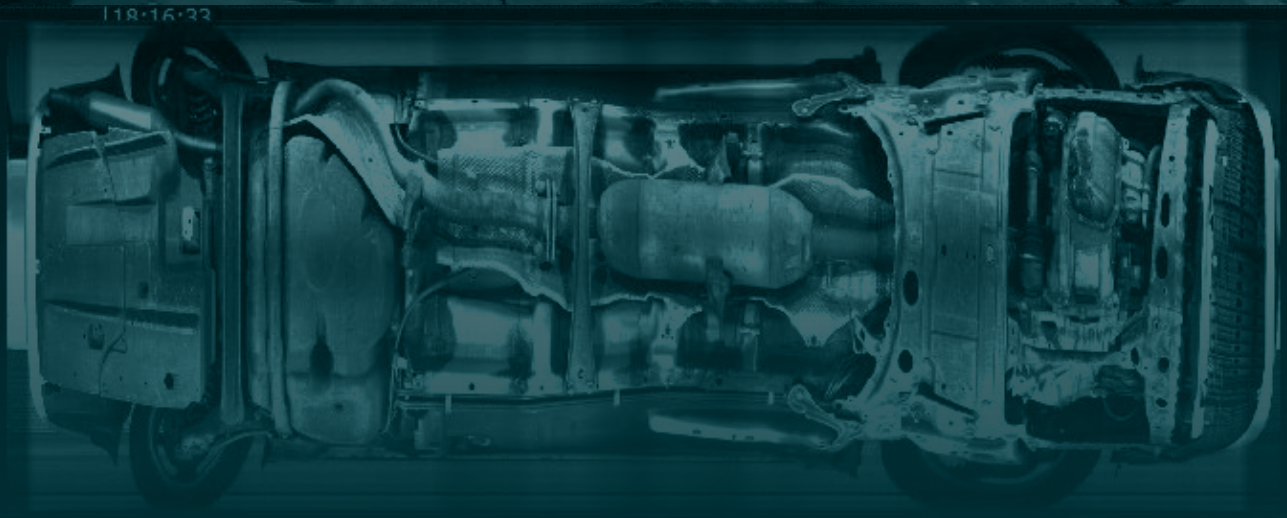
- Seamlessly integrate with other security systems, such as access control
- Facilitate synchronized monitoring
- Improve threat detection

How Under Vehicle Scanning Systems are Revolutionizing Threat Detection

Blind Spot Inspection
UVSS offers critical security by providing a clear view of a vehicle's undercarriage, a common area for concealing contraband or other threats, often overlooked by traditional security measures.

Enhanced Efficiency
UVSS offers a faster and more efficient way to inspect vehicles as compared to manual inspections with mirrors. This reduces wait times and keeps traffic flowing.

Improved Accuracy
UVSS utilizes high-resolution cameras and can sometimes include AI-powered image analysis. This offers a more accurate picture of the undercarriage compared to quick visual inspections.



Innovative Breakthroughs in Under Vehicle Inspection Technology

The growing complexity of security threats combined with the increased technical acumen of bad actors is making the traditional undercarriage systems ineffective. As a result, there is an increasing demand for more sophisticated and effective UVSS technology. Furthermore, advancements in technology can make UVSS systems faster, more accurate, and easier to use.

Next-Gen UVSS

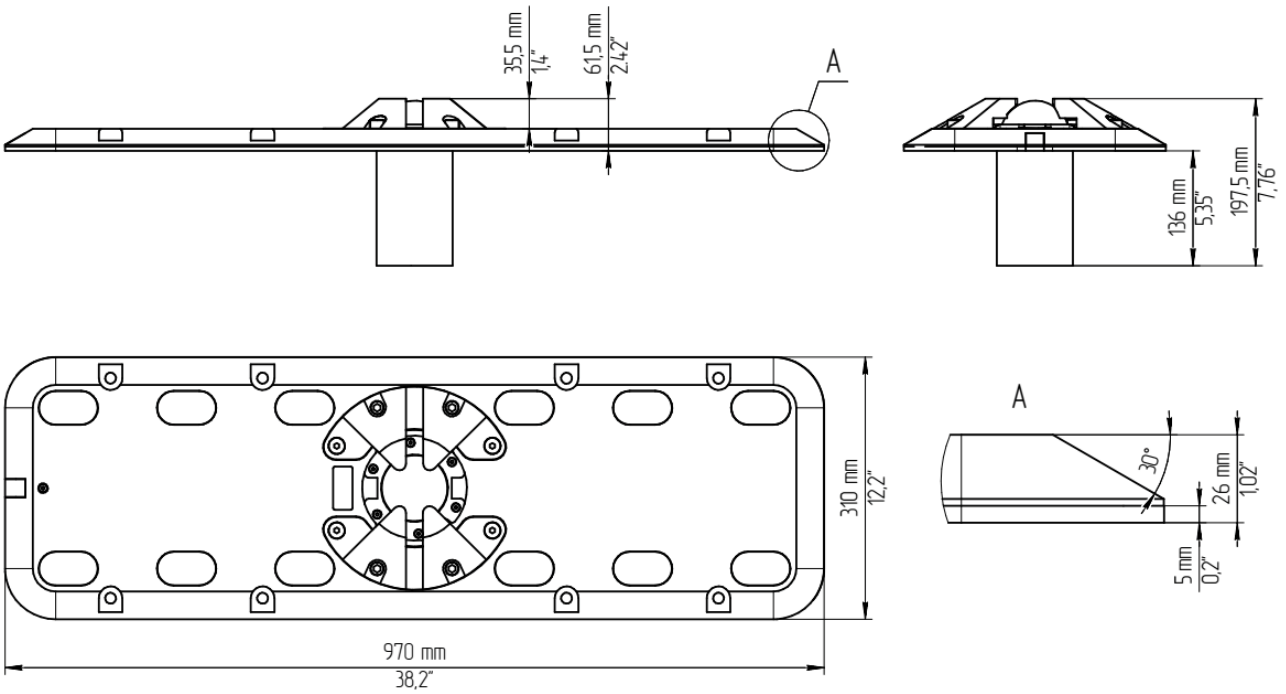
Faster Inspections, Improved Threat Detection

AI-Based UVSS [8]

AI-Based UVSS automatically captures and analyzes vehicle undercarriages in real-time. This technology represents a proactive approach to threat detection, enhancing overall security protocols with its rapid and accurate data processing capabilities. Moreover, it allows security personnel to focus on other factors such as vehicle interiors, and passenger behaviors.

3D Scanning Technology [6]

3D UVSS is an innovative technology that deploys depth-sensing technology, such as LiDAR (Light Detection and Ranging) or structured light scanners. It enables precise detection of concealed threats while minimizing false alarms through 3D modeling. Additionally, it provides support to security personnel and investigators by generating comprehensive 3D data for effective post-event analysis and historical record-keeping.



SAMI-AEC Masseh

Comprehensive Undercarriage Inspection for Threat Detection

SAMI-AEC Masseh is a locally developed solution, especially designed to bolster security across Saudi Arabia's critical infrastructure. Leveraging advanced technologies such as AI video analytics and 3D scanning, SAMI-AEC Masseh ensures a comprehensive inspection, fortifying security throughout the Kingdom. It also possesses the ability to capture high-quality undercarriage images for all vehicle types, from cars to trucks and trailers. This makes it a highly cost-effective and efficient solution for government, military, corporate, and transportation facilities requiring meticulous vehicle monitoring.

Harnessing profound indigenous market security acumen and innovative technologies, SAMI-AEC Masseh is manufactured within Saudi Arabia at SAMI-AEC facilities.

Key Pillars for an All-Encompassing Protection

Uncompromising Image Quality

- High-resolution undercarriage scans remain unsusceptible to vehicle speed fluctuations
- Patented de-warping technology guarantees exceptional image correction, eliminating distortion and stitching composite images

Advanced Data Management

- Captured undercarriage images are automatically paired with recognized license plates, facilitating efficient search and analysis
- Subsequent scans are intelligently compared to reference images, highlighting anomalies for operator review

Effortless Deployment and Maintenance

- Compact platform requires minimal infrastructure for deployment and offers exceptional durability
- Integrated video analytics eliminate the need for physical sensors, detecting vehicle presence automatically
- Optional UVSS cleaning and/or heating systems are available for diverse environments

What Makes SAMI-AEC Masseh Different?

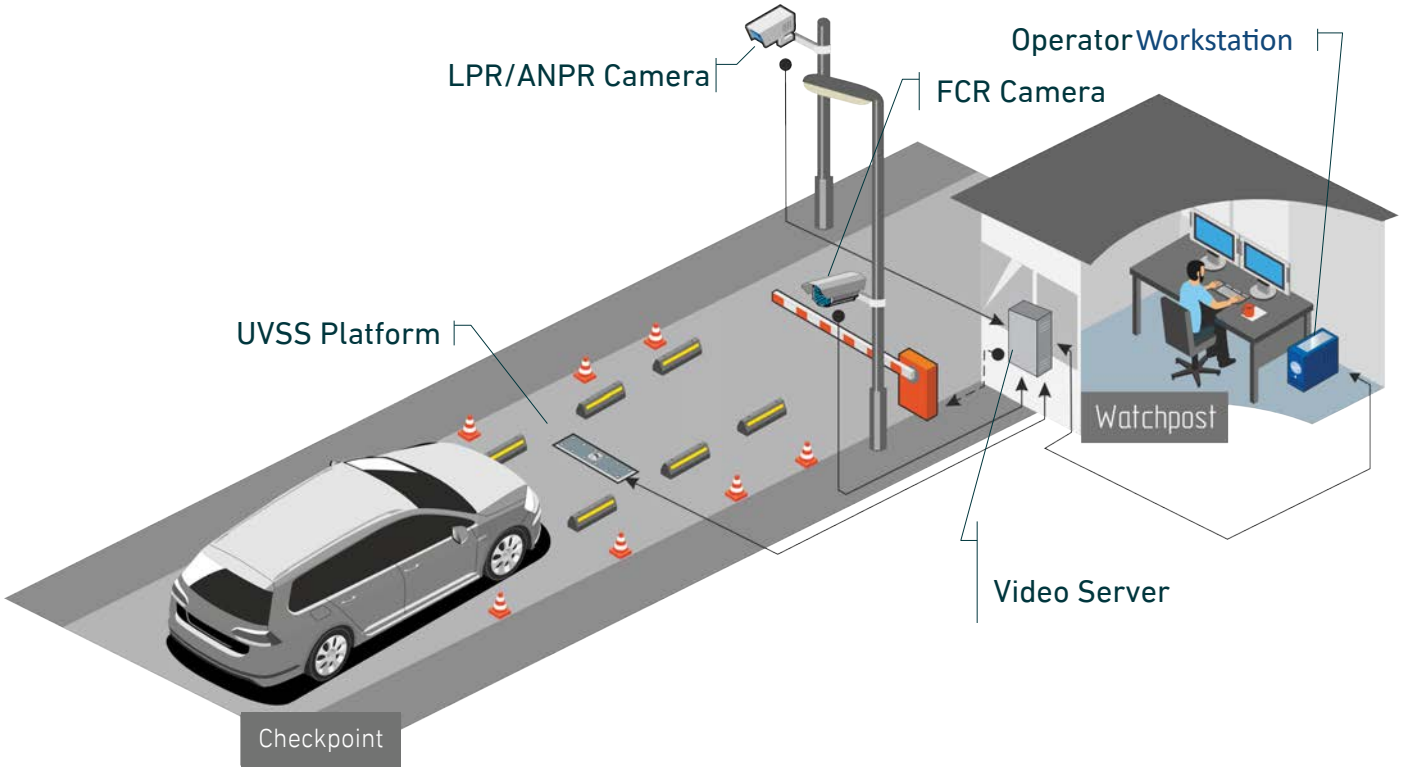
Integrated with intelligent license plate recognition utilizing video analytics

Characterized by a streamlined installation process compared to preceding generations of UVSS

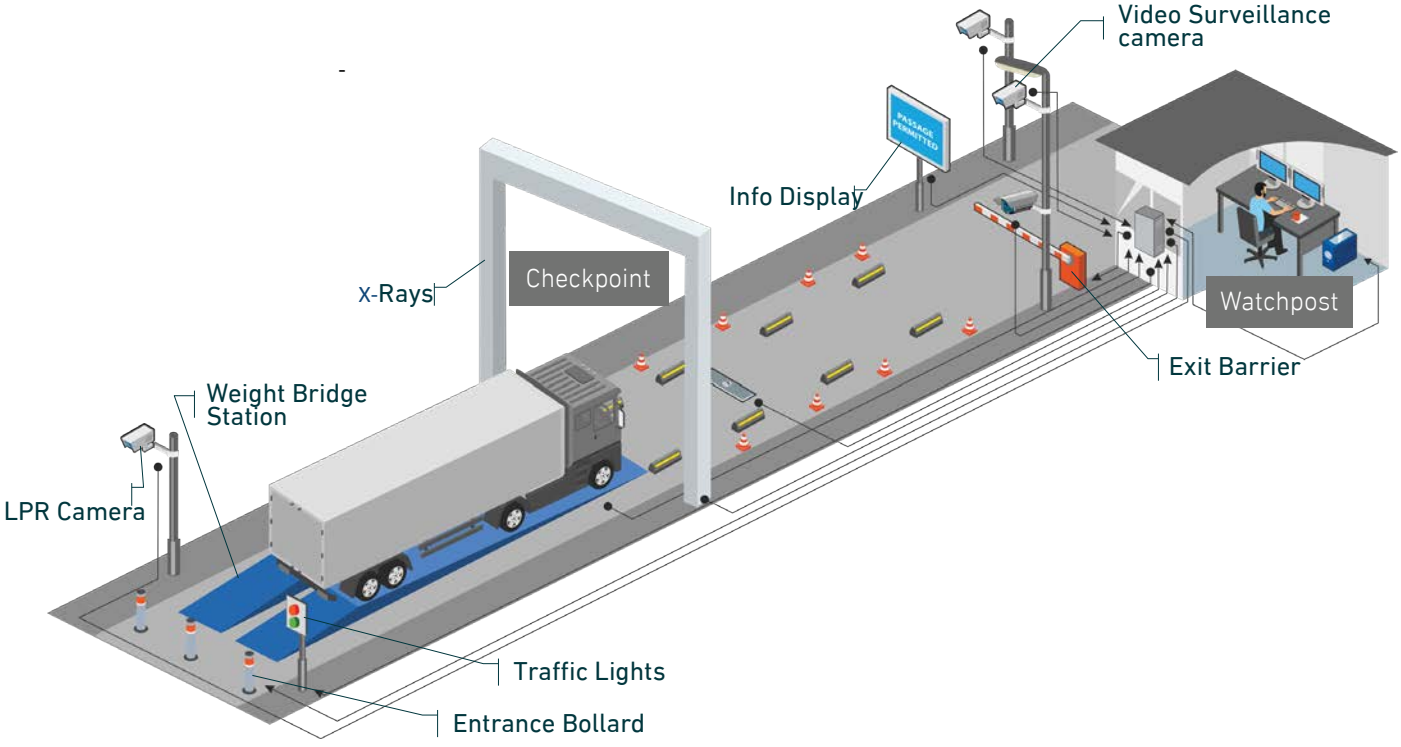
Employing video analytic detectors, this system eliminates the requirement for physical devices to identify vehicle presence

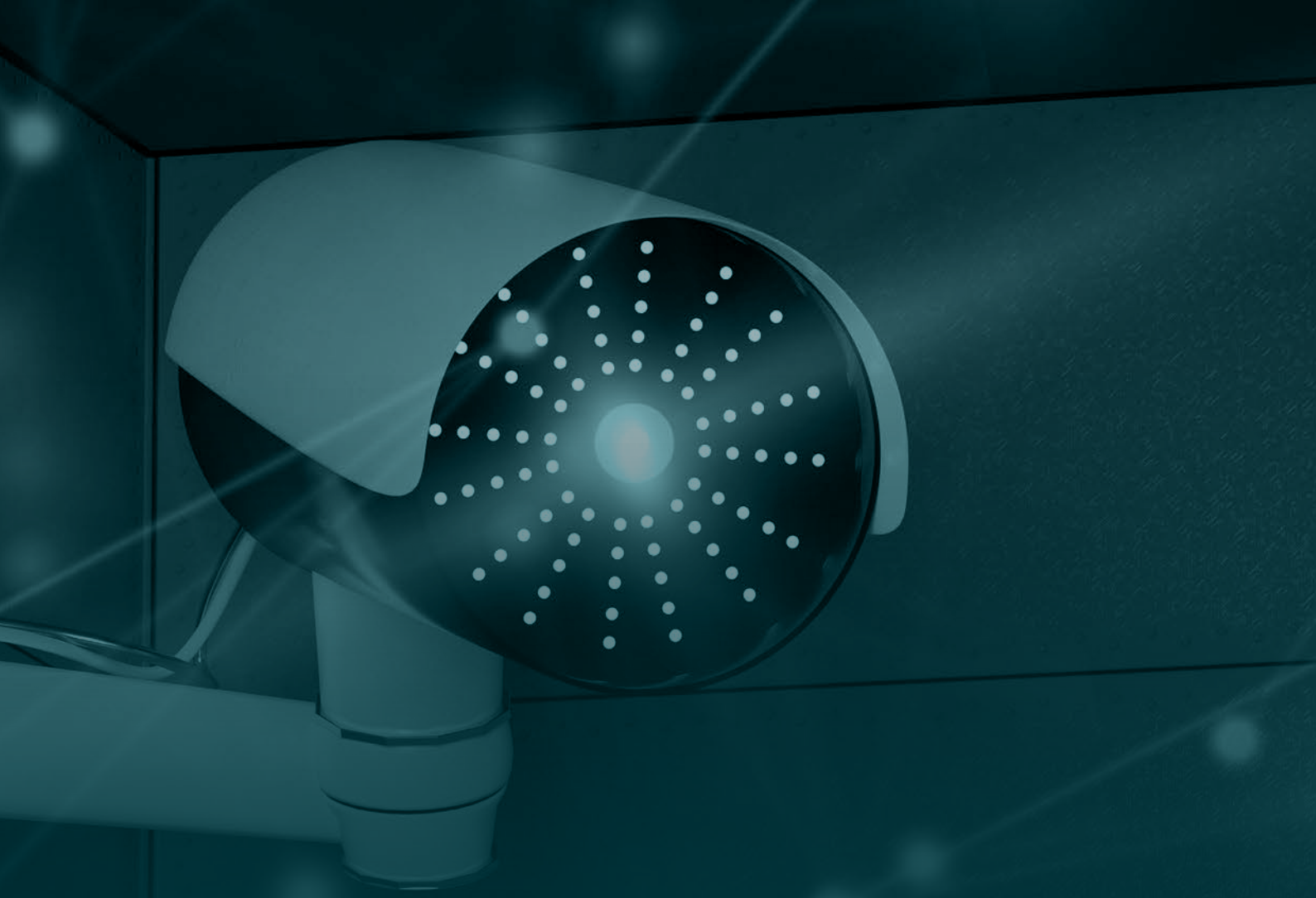
Understanding the Technical Framework of SAMI-AEC Masseh

Base System Architecture



Extended System Architecture





SAMI-AEC Masseh

Creating a New Frontier in Saudi Security Across Various Sectors

SAMI-AEC Masseh is emerging as a cornerstone technology across the KSA, safeguarding critical infrastructure, assets, and public safety. Its transformative applications highlight its ability to deter criminal activity, streamline security protocols, optimize resource allocation, and ultimately enhance public safety in critical areas.

Critical Infrastructure & Restricted Areas

Aid in detecting explosives, contraband, or unauthorized modifications on vehicles entering sensitive locations such as government facilities, power plants, or military bases

Customs & Border Patrol

Help customs agents efficiently scan vehicles for hidden compartments containing illegal items

Large Venues & Arenas

Integrate UVSS with license plate recognition (LPR) to ensure authorized vehicles only and prevent unauthorized vehicles from following authorized ones into the venue

Federal & State Properties

Provide an extra layer of security beyond traditional perimeter fencing or guard patrols

Airport & Seaport Checkpoints

Reduce the time needed for thorough undercarriage inspections, improving checkpoint throughput without compromising security

Industrial Enterprises

Aid in routine inspections, identifying potential undercarriage damage or leaks before they escalate

Conclusion

In the modern security landscape, adopting a proactive approach is necessary for organizations to remain agile and improve their security posture. Aligned with this approach, the Under Vehicle Scanning Systems (UVSS) eliminates potential threats before they materialize by providing visibility into a previously obscure realm – the undercarriage of a vehicle.

UVSS employs various cutting-edge components such as high-resolution imaging systems and advanced software processing, to create a comprehensive, high-definition picture of vehicle undercarriage. By offering seamless integration with license plate recognition, it fosters a holistic security approach.

The UVSS sector is undergoing continuous innovation, yielding exciting advancements. 3D imaging for enhanced detection, integrations of AI and ML for better threat detection, and advancements in camera technology are some of these ongoing developments.

SAMI-AEC Masseh is a cutting-edge solution tailored specifically for Saudi enterprises' unique needs, reflecting SAMI-AEC's dedication to delivering cutting-edge security technologies.

SAMI-AEC Masseh is a cost-effective solution that significantly mitigates infrastructure investments and operations by streamlining what has traditionally been a multistep procedure into a single tool. A compact solution, it has an automated visual inspection of all kinds of vehicles (from passenger vehicles to trucks) and vehicle occupant detection. SAMI-AEC Masseh represents the culmination of cutting-edge technology and meticulous engineering, empowering security personnel to make informed decisions and safeguard lives and assets.

References

1. International Security Journal (2023). What is Physical Security & Why is it Needed? Available at: https://internationalsecurityjournal.com/what-is-physical-security/#:~:text=Robust%20physical%20security%20acts%20as

2. Deloitte (2023). Physical Security: The Value of Digitalization. Available at: https://www.deloitte.com/global/en/services/risk-advisory/blogs/physical-security-the-value-of-digitalization.html

3. Saudi Vision (2017). Kingdom of Saudi Arabia Vision 2030. Available at: https://www.vision2030.gov.sa/media/rc0b5oy1/saudi_vision203.pdf

4. Allied Universal (2023). World Security Report 2023. Available at: https://www.worldsecurityreport.com/media/v1ahrj2v/a4_world-security-report_vf_en.pdf

5. Deloitte (2024). Creating the government of the future | Deloitte Insights. Available at: https://www.deloitte.com/gh/en/our-thinking/insights/industry/government-public-services/government-of-the-future-evolution-change.html

6. Intel (2023). SecurOS® UVSS. Available at: https://marketplace.intel.com/file-asset/a5Y3b0000008Ln6EAE_a5b3b0000004cw4AAA

7. Security Electronic Equipment (2023). Under Vehicle Scanning Systems: A Proactive Approach to Security-Shenzhen Security Electronic Equipment Co., Ltd_scanner_probe. Available at: https://www.secuplusinspection.com/News_Detail/1741278003508064256.html#:~:text=Under%20vehicle%20surveillance%20systems%20are

8. ISS (2020). Under Vehicle Scanning Systems Evolve Into Essential Solution. Available at: https://issivs.com/under-vehicle-surveillance-systems-evolve-into-essential-solution/

9. Arab News (2023). Saudi businesses expect low levels of security threats in 2024: report. Available at: https://www.arabnews.com/node/2382651/business-economy

10. Statista (2024). Security - Saudi Arabia | Statista Market Forecast. Available at: https://www.statista.com/outlook/cmo/smart-home/security/saudi-arabia

11. Rhombus Systems (2021). State of Modern Physical Security. Available at: https://whitepaperseries.com/wp-content/uploads/2021/11/101044_2021-State-of-Modern-Physical-Security-Report.pdf

12. Security Industry Association (2023). MEGATRENDS THE ANNUAL VISION FOR THE SECURITY INDUSTRY TM 2024 SECURITY. Available at: https://www.securityindustry.org/wp-content/uploads/2023/12/2024_SECURITY_MEGATRENDS.updated.pdf

13. Genetec Inc (2023). Embracing technology and new ways of working. [online] Available at: https://www.genetec.com/binaries/content/assets/genetec/reports/report_en_state-of-physical-security-2024_web.pdf

14. IFSEC Insider | Security and Fire News and Resources (2023). The Video Surveillance Report 2023. Available at: https://www.ifsecglobal.com/downloads-resources/the-video-surveillance-report-2023/#:~:text=In%20the%202023%20Video%20Surveillance

SAMI
ADVANCED
ELECTRONICS
شركة الإلكترونيات المتقدمة

SAMI Advanced Electronics Company
King Khalid International Airport Industrial Estate
P.O. Box 90916,
Riyadh 11623, Saudi Arabia

+966112201350 **Email** - info@aecl.com

/AECSaudiArabia