

# **Perimeter Protection and Intrusion Detection**

For commercial and critical infrastructure sites



# Detection is the cornerstone of the security system

Every security system needs to be triggered by an event and it is usually the fact that a person, object or vehicle is moving or entering into an area.

### Why detection?

An intruder can gain entry to a site from many different ways and securing sites has become a more complex task. OPTEX® solutions are designed to detect physical intrusion and unauthorised access which still account for a huge proportion of threats. They are a key element of the security system to alert at the right time and prevent damages or theft.

#### Why OPTEX?

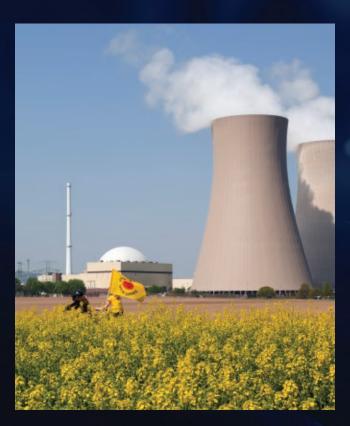
OPTEX has been a leading sensor manufacturer for over 40 years, providing high performance detection and video analytics systems for security, safety and business applications. Its multi-layered intrusion detection systems are deployed in thousands of installations worldwide, from military and government facilities to transportation and utilities sites and other critical infrastructure.



# Layers of detection to suit the site requirement

# **Perimeter protection**

Perimeter security is the first line of defence against intrusion and unauthorised access, and it should provide an efficient way to quickly identify threats or suspicious activities.







#### **Outer perimeter**

For sites surrounded by a sterile zone or an area with no public access, it is useful to be alerted if people or vehicles are approaching or loitering around the site perimeter. It provides pre-warning so the situation can be monitored and escalated if necessary.

#### Perimeter line

If a site is surrounded by a perimeter fence or wall, constant monitoring is needed as no one should intrude on the perimeter line during or after working hours. A number of sensing technologies can be deployed to remain armed at all times while not affecting the day to day operations.

When there is no physical perimeter and the access to the site is open, such as a car dealership or industrial park, a virtual perimeter can be created and activated to protect the premises out-of-hours. This can be achieved with Laser walls (LiDAR technology) or point-to-point Active Infrared (AIR) technology.

# Approach detection and tracking

Once intruders have penetrated an area it is critical to track their whereabouts and follow them using PTZ cameras.

It is common to have a number of intruders, each aiming at different areas; hence the intrusion system needs to be intelligent enough to detect and track several intruders concurrently, guiding cameras and remote monitoring staff to assess the situation.



# **Building and asset protection**



Expensive machinery, valuable material, fuel tanks or chemical containers stored outdoor require the highest level of security to avoid theft, misuse and disruption to the business.

Banks, government or corporate buildings need to protect any access to their building including roofs, windows, balconies and fire exits while not disrupting flexible working hours and possible maintenance work.

Indoor restricted areas, such as bonded areas in warehouses, IT server rooms etc. require accurate detection integrated with access control to check credentials and video surveillance for verification and case management reports.

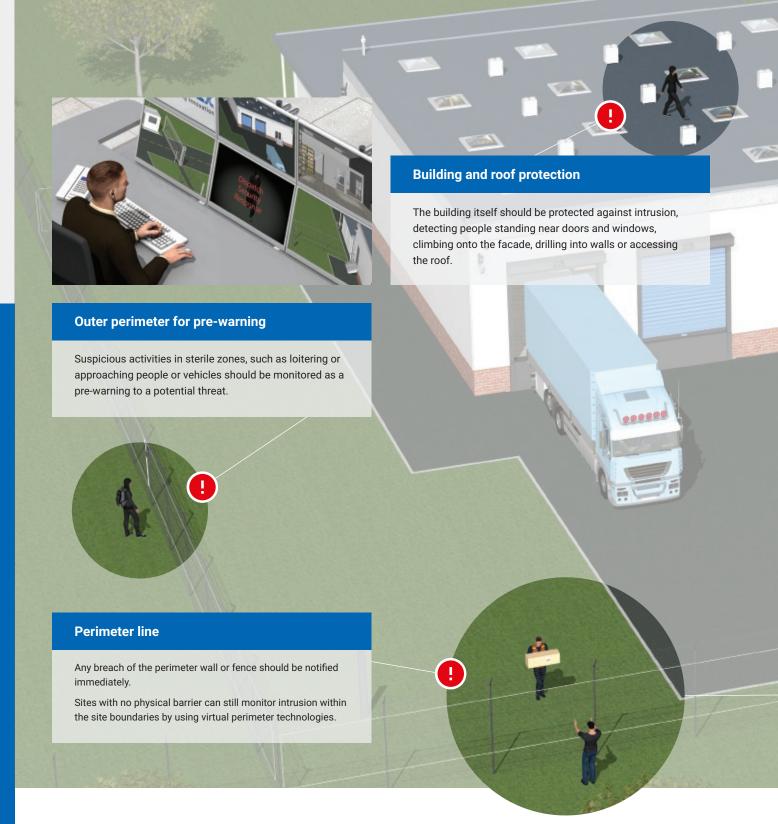






In museums, galleries, bars or boutiques, there is a need to protect artwork, valuables and expensive or licensed goods while allowing free movement of people. Here customised and precise sensing technologies can be used to detect hands approaching/ touching specific items. Additionally, for restricted areas, the detection technology can be combined

with access control to validate the credentials of the person entering the zone.



# Sensing technologies to protect each layer

# Fence intrusion detection with fibre optics sensors

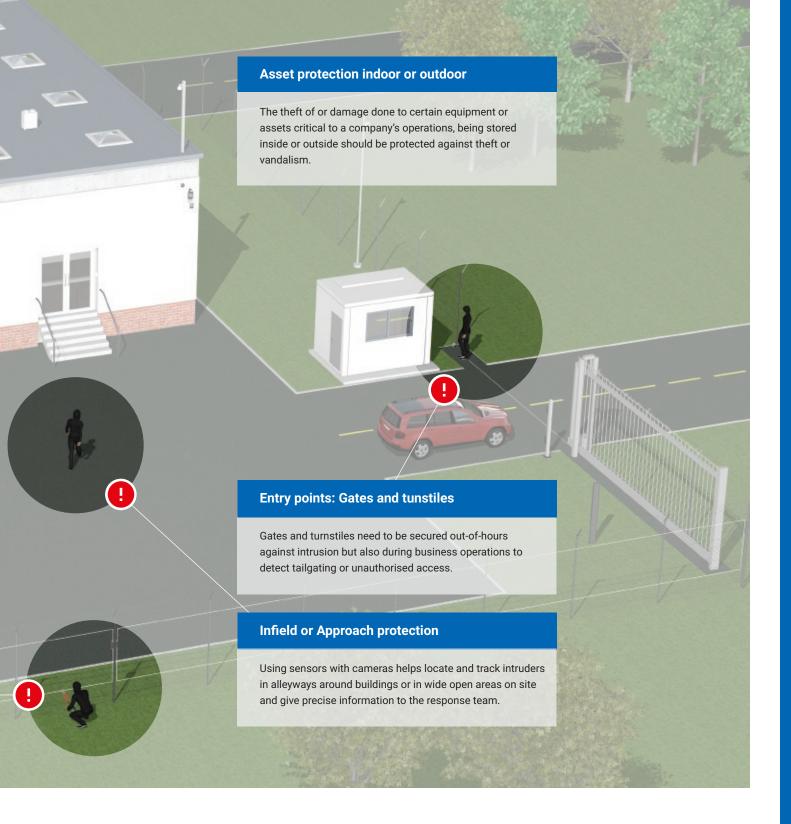
When a security fence is in place, fibre optic technology is a very accurate way to detect if someone has cut through, climbed over or crawled under it. Fiber Sensys PIDS are ideal to protect large fence perimeters.



# Creating virtual perimeter with active infrared

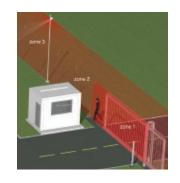
Active Infrared (AIR) detection consists of a transmitter emitting constant infrared beams to a receiver, creating a virtual perimeter. If a person or vehicle crosses the beams it interrupts the reception and creates an alarm.





### LiDAR virtual wall or plane

Laser technology (LiDAR) enables an indoor or outdoor virtual wall or plane to be created. The laser wall can be used as virtual perimeter or as an additional protection layer above and along the wall or fence to detect intrusion. The laser plane generates a horizontal detection layer to protect the roof, ceiling or the in-field area.



#### Volumetric thermal detection

To cover wide open areas, or alleyway between the perimeter and the building, OPTEX long range thermal sensors are designed to work in conjunction with CCTV cameras to track across detection zones.



# Fibre optic sensors

# Our Fiber SenSys, fibre optic sensors

Our fibre optic sensors use advanced signal processing to detect intruders attempting to climb over, crawl under or cut through fenced perimeters ranging from 50 meters up to over 100km.





Beyond fence detection, our latest sensors can also be buried allowing them to detect people walking or vehicles approaching the perimeter. In addition to perimeter protection, several of our fibre optic sensors can be mounted on walls or ceilings to detect drilling.

The detection principle consists of a laser pulse sent through fibre optic sensing cable where disturbances to the fibre cable change the characteristics of the light monitored by the Alarm Processing Unit (APU). The APU algorithms intelligently analyse these disturbances and categorise them. All of our APUs can be tuned to distinguish disturbances created by wind, vibrations generated by nearby traffic, and small animals from those caused by genuine intrusions, such as climbing over or cutting the fence.

#### Designed for harsh and hazardous environments

Fibre optic sensors are ideal for high-security/harsh environment applications. Solutions can be designed for remote deployment with no power or communications needed in the field, reducing the infrastructure requirements and allowing the sensor to operate in locations prone to lightning and RF interference, corrosive environments including chemicals and salty sea air, and explosive environments.

#### Locating the intrusion

All sites have different characteristics and security requirements. To meet these needs, we offer a full line of perimeter sensors which includes both zone sensors and point location sensors.

#### Independent zones

For smaller systems or sites that require high-fault tolerance, zone sensors are the ideal choice. Although site-specific, an average zone is approximately



100m. We have sensors that can support one zone up to 25 zones. Whether your site is a simple commercial storage area, an industrial facility, or a high-security military site, we have a system that will fit your needs.

#### Point detection

As the size of the site increases, responding to intrusion alarms becomes more difficult. Knowing exactly where the intruder is located becomes more and more of a necessity for timely alarm response. Our point locating fiber sensors are ideal key components for larger sites or sites that require point detection. Benefits include full integration with video systems to provide video verification.





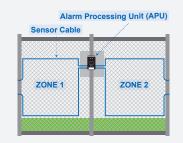
#### **Durable and cost-competitive**

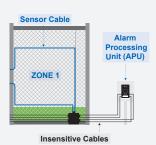
APUs have a projected life of 20 years and offer excellent performance and low ongoing system maintenance costs making them very durable and giving them a low cost of ownership.

#### Fiber Defender® 300 Series

#### Models: FD322, FD331/FD332, FD341/342 and FD348R

The Fiber Defender 300 Series offers cost-effective, packaged one and two-zone fibre-optic detection solutions to provide an easy deployment to protect small to medium-sized perimeters.

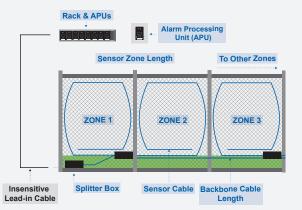




### Fiber Defender® 500 Series

# Models: FD504, FD508, FD525, FD525R, FD525-HALO™

The Fiber Defender 500 Series Alarm Processors are the superior choice for medium to large projects with multiplezone requirements, from 4 up to 25 individual sensor cables/zones that detect simultaneous intrusion attempts. In addition the FD525-HALO utilizes its own custom hybrid cable which eliminates the need for conduit.



# Fiber Defender® 7000 Series

#### Model: FD7104

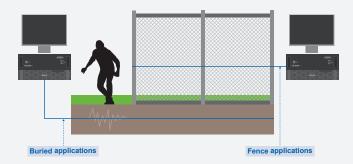
The PoE compliant Fiber
Defender 7000 APU Series
features a new generation
algorithm and a web interface
with built-in tuning and calibration
software that provides remote
tuning.

### **EchoPoint™ Series**

#### Point Locating Distributed Acoustic Sensors for large perimeters

The EchoPoint Distributed Acoustic Sensors (DAS) utilise the latest technologies in fiber optic sensing and machine-learning algorithms to provide the most advanced solution for applications requiring long-range, point locating intrusion detection sensors. These advancements make EchoPoint sensors a key part of the solution in large sites where precise intrusion location is needed.

#### Models: EP9150™ and EP9210™



# Select the right fibre optic model for your application

Fibre optic series	Fiber Defender (FD) 300 series				FD 500 series			FD 7000 series	EchoPoint
Model	FD322	FD331/2	FD341/ 2	FD348R	FD504/8	FD525-Halo	FD525	FD7104	EP9150/EP9210
Fence application	•	•	•	•	•	•	•	•	•
Wall application	_	•	•	•	•	_	•	•	•
Buried	-	-	_	_	-	_	-	_	•
High security sites	_	•	•	•	•	-	•	•	•
Point location	_	_	_	_	_	-	-	_	≤5m/1.5-5m
Remote capable (insensitive lead)	_	-	20km	20km	5km	5km	5km	5km	•
Number of SW tuning parameters	6	30	30	30	>30	>30	>30	7	Machine learning- based settings
IP-enabled	•	Opt.	Opt.	•	•	•	•	•	•
Number of channels (zones)	2	1/2	1/2	8/ Ind. Rack card	4/8	25	25	4	<sup>1</sup> Programmable
Max. sensing cable per zone	500m	5km	5km	5km	800m	800m	800m	800m	<sup>1</sup> Programmable

<sup>(1)</sup> The EP9150 is a single channel 50km sensor with up to 2500 software zones.

<sup>(1)</sup> The EP9210 is a dual channel 20km sensor with up 1000 software zones in linear configuration (10km and 500 zones in cut immune configuration).

<sup>\*</sup> Specifications can be subject to change without prior notice.

# **Smart Line Series**

### Active Infrared beams for perimeter intrusion detection

For industrial or critical infrastructure applications, Active Infrared beams (AIR) provide a detection line similar to a trip wire or a virtual wall.



Active infrared beams consist of a pair of transmitter and receiver units, where the transmitter unit constantly emits infrared beams to the receiver and will trigger an alarm if the transmission is broken by an intruder. The detection is accurate even in warm countries where human temperature is similar to ambient.

The beams can be mounted on poles next to the fence to detect intruders crossing the fence line or on top of a wall or fence to detect anyone climbing. Some models can be stacked in beam towers which offer extra flexibility in terms of system design.





#### Reliable detection in harsh environments

Our SmartLine AIR sensors feature Quad beams which significantly reduces false alarms caused by wildlife or falling leaves.

Most of our Quad sensors are equipped with four selectable frequency channels making it easy to stack in beam towers as well as providing a highly reliable signal transmission between receiver and transmitter even when exposed to strong sunlight or harsh weather conditions.

#### Simple installation

The quality of the signal transmission relies on a good alignment between the transmitter and receiver beam. To make the optical alignment as easy as possible, OPTEX active beams are equipped with





Transmitter



Receiver

a telescopic magnifying lens, a sound gauge to validate the signal level sent and received, complemented, for some models, by five LEDs rating the signal from poor to excellent.

# **Durable and weather** resistant

IP65 rated, the Smart Line series has been designed to resist against both water and dust. The two hoods featured on the front cover are positioned over the upper and lower beam to prevent frost from attaching to the cover and potentially affecting the signal power. The housing is made of UV resistant polycarbonate material to avoid deterioration caused by ultraviolet rays and maintain the good transparency for the infrared beams over time. Several

models are also equipped with sunshine protection technology to give better performance against external light sources such as sunlight, mercury-vapour lamps, and fluorescent lights. In addition, for the coldest climates a heater accessory is available for all hardwired beam models to allow them to work properly.



### Smart-Line SL-QDM, SL-QDP (wired)

#### SL-200/350/650QDM, SL-200/350/650QDP

The SL-QDM and SL-QDP series is a range of high specification wired active infrared beams, designed to sustain harsh environmental conditions and ensure optimal communication between transmitter and receiver. They offer double modulation beams that differ in pulse patterns enhancing the discrimination of potential sources of false alarms such as sunlight and severe weather. They can be stacked in



towers to create a virtual perimeter. When used in conjunction with our PiE-1 encoder, they can transmit alarm events via the network to many VMS and PSIM platforms that have an integrated OPTEX Redwall event code.

### Smart Line QFR and QNR series (wireless)

#### SL-350QFR, SL-350QNR

Ideally suited to protect remote locations or areas difficult to wire, the Smart Line TNR series provides up to 60m and SL-QFR and SL-QNR series up to 100m perimeter protection that is completely wirefree, reducing the installation time and cost to a minimum. The battery operated sensors can accommodate most wireless transmitters available on the market, or OPTEX can provide beams with pre-fitted wireless transmitters.



#### Pre-built beam towers

#### QDM, QDP and QFR models can be stacked into pre-assembled beam towers

When using active infrared beams for perimeter protection it is good practice to mount them into towers rather than on to walls or poles. This enhances the security level as the housing protects them from possible vandalism and conceals the



mounting location making it very difficult for potential intruders to determine the number and height of beams installed. Another key benefit of using towers is the ability to host several supplementary components into a weatherproof enclosure, which can be mounted in a tidy and organised way. Towers can be single-sided or double-sided, wall mounted or ground mounted, and are available in 2 or 3m housing.



# Select the right IR beam model for your application

<b>Smart Line Series</b>	SL-QDM, SL	-QDP Series	QFR and QNR Series			
Model	SL-200QDM, SL-350QDM, SL-650QDM	SL-200QDP, SL-350QDP, SL-650QDP	SL-350QFR	SL-350QNR		
Reach	60m/ 100m / 200m	60m/ 100m / 200m	100 m	100 m		
Connectivity	Wii	red	Wireless			
Beam frequency	4 channels selectable	4 channels selectable	4 channels selectable	-		
Fog resistant	***	**	*	*		
Lightning resistant	*	*	**	**		
Frost resistant	***	**	*	*		
Sunshine protection technology	•	•	-	-		
Beam power control selector	•	•	-	_		
Automatic transmit power control	•	-	-	_		
Re-transmission	•	-	-	_		
LED indicator and sound assist	•	• (receiver)	-	-		
IP/ PoE option	• (with PiE-1 encoder)	• (with PiE-1 encoder)	-	-		
Can be stacked into Beam towers	*up to 2	*up to 2	*up to 2	_		

<sup>\*</sup> Specifications can be subject to change without prior notice.

# **REDSCAN Series**

### Sophisticated and precise LiDAR detector

REDSCAN is an award-winning laser detector that identifies the size, speed and distance of a moving object and can function in effect like an invisible wall or plane. Using LiDAR technology, the sensors are unaffected by light or heat sources making it a very reliable detection system.

#### Intelligent high resolution detection

The REDSCAN sensor constantly scans the detection area, emitting a laser beam which returns to the sensor after hitting an object. This allows the very quick and precise detection of any object calculating its size, speed and distance from the sensor. The sensor can therefore be configured

to trigger an event or alarm only for a certain size of object such as a car, a person or even a hand approaching a valuable object (indoor mode) and ignore the others, making it very versatile.

The algorithms built into the sensor define the distance and size of the object so the perspective will always be correct, regardless if the object is located right next to the sensor or at the furthest point of its detection range.

#### Versatile sensor for endless applications

The REDSCAN sensors can be mounted in horizontal mode creating a virtual plane to protect open areas, ceiling and roofs or in vertical mode creating a virtual wall for perimeter, façade, gate and asset protection. The virtual wall can be tilted by 30 or 45 degree allowing it to detect a low target such as a crawling person or an object traveling fast such as a running person. It can work in conjunction with an access control system to detect unauthorised access, such a jumping over a turnstile, detecting a person entered a restricted area without the right credentials.









### Independent detection zones and point location

All REDSCAN LIDARs provide a number of detection zones with between four and eight independent alarm outputs, maximizing the chances of detecting where an intrusion has occurred and directing pre-set cameras to verify the event. The REDSCAN Pro also provides the ability to set independently the target size and sensitivity

for each zone. Different profiles can be set to match the security requirement such as day/ night settings.

The LiDARs provide live X&Y coordinates and when integrated with a video management platform it allows the very precise mapping and tracking of the detected objects. .



# Easy installation and configuration

The REDSCAN LiDARs are IP devices that can be powered over Ethernet as PoE (RLS-2020) or PoE+ (Redscan pro ) and easily added onto any networked security system. They are integrated

with most Video Management Software platforms. The detection area can be easily and precisely customized. Configuration and settings are completed using the Redscan Manager for the RLS-2020 and web browser for the REDSCAN Pro.

### RLS-2020 series

# Models: RLS-2020I and RLS-2020S

The REDSCAN Mini series includes an indoor only model, RLS-2020I and a high resolution indoor and outdoor model RLS-2020S. The latter can be used to detect objects being thrown inside a building from a controlled area to a public area or vice versa. It can also detect very small objects such as fingers.

The detection area of maximum 20x20m, is fully customisable and the device can be custom painted to blend with its environment.



The RLS-2020 series is Grade 3 compliant.

### **REDSCAN PRO series**

# Models: RLS-3060V and RLS-50100V

The REDSCAN Pro is an advanced LiDAR series accurately and reliably detecting moving objects up to 100m away and providing eight detection zones with independent settings for each. The build-in assistance camera enables alarm logs to be recorded with images for visual verification. It is also a very useful set-up and maintenance tool. The laser scanners are ONVIF Profile S compliant making integration easy with any



# Onvir<sup>®</sup> S

ONVIF platform and provide a high level of network security: https and IEEE 802.1x). Ideal for perimeter protection, roof protection and high security applications.

### Select the right model for your application

REDSCAN series	RLS-202	0 series	REDSCAN Pro series				
Models	RLS-2020I	RLS-2020S	RLS-3060V	RLS-50100V			
Installation location	Indoor	Indoor/ Outdoor	Indoor/ Outdoor	Indoor/ Outdoor			
Detection range	20x20m 95°	20x20m 95° (expansion mode 30m radius)	30x60 m, 190° (expansion mode 50m radius)	50x100 m, 190° (expansion mode 80m radius)			
Independent detection zones	4	4	8				
Alarm outputs	3 outputs, 28 VDC 0.2A max.	N.O./N.C. Selectable	6 outputs, 28 VDC 0.2A max. N.O./N.C. Selectable				
Detection resolution response time	0.25 degree / within 75msec to 15 min.	0.25 degree / within 75msec to 15 min. (for indoor and outdoor mode)	0.25 degree / within 75msec to 15 min.	0.125 degrees / within 100 msec. to 15 min.			
		0.125 degree / within 100msec to 15 min. (for indoor high resolution mode)					
Auto area adjustment	-	-	•	•			
Indoor throw-in mode	-	•	-	-			
Wall loitering detection	-	•	•	•			
wall/ fence top protection mode	_	•	•	•			
Configuration	REDSCAN Manager software		Intuitive Web User Interface (via web browser)				
Integrated camera	_	-	•	•			
Recording of events and images on sensor	_	-	•	•			
Network protocol	UDP/TCP/DHCP/DNS/HTTP/HTTPS	S/FTP/SNMPv1/v2c/v3/ICMP/ARP	UDP/TCP/HTTP/HTTPS/IPV4/DNS/DHCP/SNMPv1-v3/NTP/WS-Discovery/ONVIF				
Operating temperature	-40°C to +50°C -40°C to +60°C		-20°C to +60°C (with optional RLS-LWVH: -40 °C to +60°C)				
Built-in bracket	_	-	•	•			

<sup>\*</sup> ONVIF is a trademark of Onvif, Inc.

<sup>\*\*</sup> Specifications can be subject to change without prior notice.

# **REDWALL SIP Sensor series**

### Volumetric detection for approach and alleyway protection

The long-range and high-mount REDWALL SIP outdoor detection systems provide volumetric detection for wide open areas and long alleyways. Working in conjunction with a CCTV system, they will detect and track intruders across detection zones and guide cameras to visually verify the alarm activation.





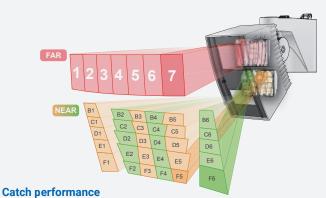
#### **Detecting and Tracking in open area**

Once intruders are on site, especially on large sites, it is a challenging task to track their whereabouts. The OPTEX SIP series sensors can be mounted up to 4m height and provides a wide coverage up to 50mx30m or long narrow range up to 100m by 3m and connect to cameras to detect where the targets are and trigger camera pre-sets. Multiple SIPs can be connected to a single PTZ camera.

#### Two in one sensor with the Creep zone

SIP-3020/5-404/5-4010/5, SIP-5030 and SIP-100 analogue and IP models.

The creep zone is the area located under the sensor to detect anyone walking underneath the PIR or trying to tamper with the sensor. The SIP models with creep zone functionality features an independent sensor looking down, providing 5m 90 degree arc detection, which can be rotated by 270 degrees. When used with PTZ camera it allows to see if anyone is there, waiting to strike.



Detection is the cornerstone

of all event-driven security systems, and it is crucial to ensure no intrusion is missed. To provide best catch performance throughout the detection range, the REDWALL outdoor sensors are equipped with a near and far sensing area, featuring independent sensitivity settings that automatically adjust to the ambient temperature and light conditions to ensure no detection is missed.



#### Anti-vandalism features

All REDWALL SIP sensors are made of reinforced polycarbonate housing and feature antivandalism functions to notify the system if they have been tampered with. This consists of an Active Infrared anti-masking detection and anti-rotation function with accelerometer.

#### Precise detection using the Area View Finder

The SIP sensor's lens features many sections to detect moving objects. Using the Area View Finder accessory, those sections can be identified on the field of view of the sensor to identify sections outside the detection area that should be masked to avoid any risk of overspill or nuisance alarms created by vegetation.

# Flexibility of Wireless SIPs

Our battery powered SIP-3020WF/ 404WF/ 4010WF work with most universal transmitters enabling quick deployment for temporary sites such as construction sites or events, being used for CCTV Towers or simply when the access to main power is challenging.



### Added functionalities with the IP series

Models: SIP-3020/404/4010/ 5030/100-IP-BOX SIP-3020/5-404/5-4010/ 5-IP-BOX

The SIP-IP\_BOX series feature our IP encoder PiE-1 which is Integrated with many VMS platforms. A number of additional alarm event codes can be transmitted allowing the system to be more dynamic, creating rules for different events. For instance, if two detection zones are simultaneously activated (Creep and Near for instance) a COMBI code is generated to trigger a specific camera view



to see both areas rather than juggling back and forth with two pre-sets. Another benefit of the IP integration is to monitor devices and alert the management software if any Redwall SIP is not working or dropped off the network.

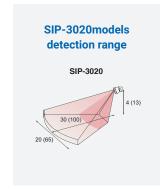
### Select the right model for your application

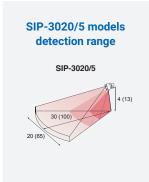
All sensors can be mounted between 2.3 to 4m height.

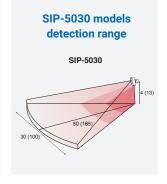
	Detection range	Auto sensitivity adjustment	Creep	Alarm output	Connectivity	Device monitoring / combi codes	Operating temperature	Anti- vandalism
SIP-3020/ SIP-404/SIP-4010	30x20m 40x4 40x10m	•	_	1	Hardwired	_	-25°C- +60°C +40°C+ +60°C with optional heater (heater can't be used when using PoE)	•
SIP-3020/5-404/5-4010/5		•	•	2	Hardwired	_		•
SIP-3020/404/4010-IP-BOX		•	_	1	IP/PoE	•		•
SIP-3020/5-404/5-4010/5-IP-BOX		•	•	2	IP/PoE	•		•
SIP-5030	50x30m	•	•	2	Hardwired	_		•
SIP-5030-IP-BOX	SUXSUM	•	•	2	IP/PoE	•		•
SIP-100	100x3m	•	•	3	Hardwired	_		•
SIP-100-IP-BOX		•	•	3	IP/PoE	•		•
SIP-3020WF/404WF/4010WF	30x20/ 40x4/40x10m	•	•	1	Battery operated*	_	-25°C +60°C	•

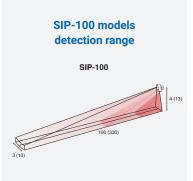
<sup>\*</sup> Batteries and wireless transmitter not provided

 $<sup>\</sup>ensuremath{^{**}}$  Specifications can be subject to change without prior notice.







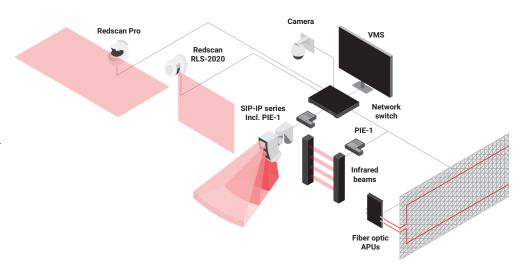


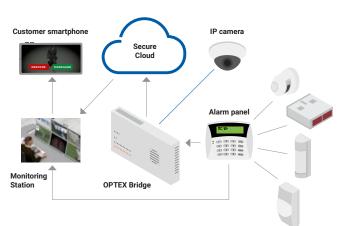
#### **Additional OPTEX solutions**

# Sensor-lead visual verification

To facilitate the efficient video verification of alarm events, sensors and cameras should work together, matching the detection coverage with the camera's field of view and the detection zones with the pre-sets.

OPTEX IP sensors are integrated with the key Video Management Software platforms to enable a direct alarm communication with security platforms and the device monitoring, ensuring that all equipment is working as it should.





# Visual verification for monitored alarm systems

Another part of OPTEX offering is the Cloud based Intelligent Visual Verification solution, which consists of an IP gateway on site and a Cloud portal accessible to the participating monitoring stations. On site, the OPTEX Bridge connects and pairs indoor and outdoor intrusion sensors

and/ or panic buttons with IP cameras and transmits the event video securely to the Cloud. The monitoring station accesses the footage immediately within the Monitoring software in place and can share it with the site owner/ carer to confirm the alarm or dismiss it.



#### **Access Security**

To protect buildings against unauthorised access, OPTEX provides tailgating detection systems. The OV-102 is designed to detect when a person has followed another through an open door or someone has exited via the same door without using his/her access credentials. Tailgating prevention in airlocks or revolving doors are also part of OPTEX's portfolio.



#### **Vehicle sensors**

Vehicle detection is mainly used for gate or barrier activation but also for many other applications such as alert for drive through and sign activation. OPTEX offers microwave-based single lane vehicle sensors. The OVS series is installed above ground, as opposed to ground loop systems that require costly and unsightly civil works, and can detect vehicles of all types.

Some solutions and products featured in this brochure are not available in every countries, please contact your local OPTEX representative for further details.



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