

TONSYNR®

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Oil Spill Monitoring System

Oil spill monitoring system

The oil spill monitoring system, through a non-contact method, can monitor the oil leakage situations in various scenarios in real time around the clock. It features high sensitivity, high accuracy, and fast response speed, and can meet the monitoring needs of the entire life cycle of various oil products. The early warning mode of the system significantly reduces the probability of large-scale oil spill accidents, protecting ecological security from the source. It is a key technical support for implementing the environmental protection principle of "prevention first" and achieving sustainable development, and has an irreplaceable strategic significance.

This system can be used for oil leakage monitoring in various scenarios, especially suitable for applications in onshore oil extraction, oil storage tanks/transport pipelines, offshore oil platforms, ports/wharves/berths /waterways/anchorage areas, industrial production and emissions, aircraft/automobile filling stations, and turbine outlets of hydropower stations.



Technical principles

Spectral Analysis

Determine whether an oil film exists

When laser is shone onto the surface of an object, the oil film will emit a spectrum. The spectrum signal is received by the receiver, and based on this, it can be determined whether an oil film is present.

Identification of oil film material types

The computer conducts data analysis and feature extraction on the collected spectral images, and compares the spectral curve with those in the known substance standard spectral library, thereby identifying the type of substance in the oil film.

Pulsed Laser

Semiconductor laser light source

The UV light source is a semiconductor laser pulsed light source. Compared with UV diode (LED) light sources and UV light sources, this light source has significant advantages in terms of monochromaticity, directional stability, coherence, and high energy.

Light source undergoes pulse modulation.

The UV semiconductor pulsed laser uses TTL modulation and releases a strong beam within each pulse. This laser is very stable and does not change over time or due to factors such as temperature.

Enhance Raman algorithm

Analysis of oil film thickness

By analyzing the Raman spectra of the oil film, the changes in the thickness of the oil film can be observed, providing data support for pollution assessment and treatment. The Raman algorithm breaks through the limitations of traditional thickness detection, expands the semi-quantitative analysis range to 1-30mm, and achieves wide-range coverage.

System Characteristics

High reliability

With high protection level and high corrosion resistance design, it can meet the requirements of harsh environmental conditions in all weather, all time and in all aspects.

High integration

Combined with the function of oil film identification and video capture, the oil pollution can be comprehensively detected and recorded, which provides important technical support for environmental protection and incident handling.

High sensitivity

In the early stage of the oil spill incident, it can realize the rapid identification of the oil film on the water surface, qualitative composition of the oil film material, with the minimum oil film detection thickness as low as 1 μ m.

High flexibility

Cylindrical fixed point monitoring products and PTZ cruise scanning products can be arbitrarily selected, easy to use.

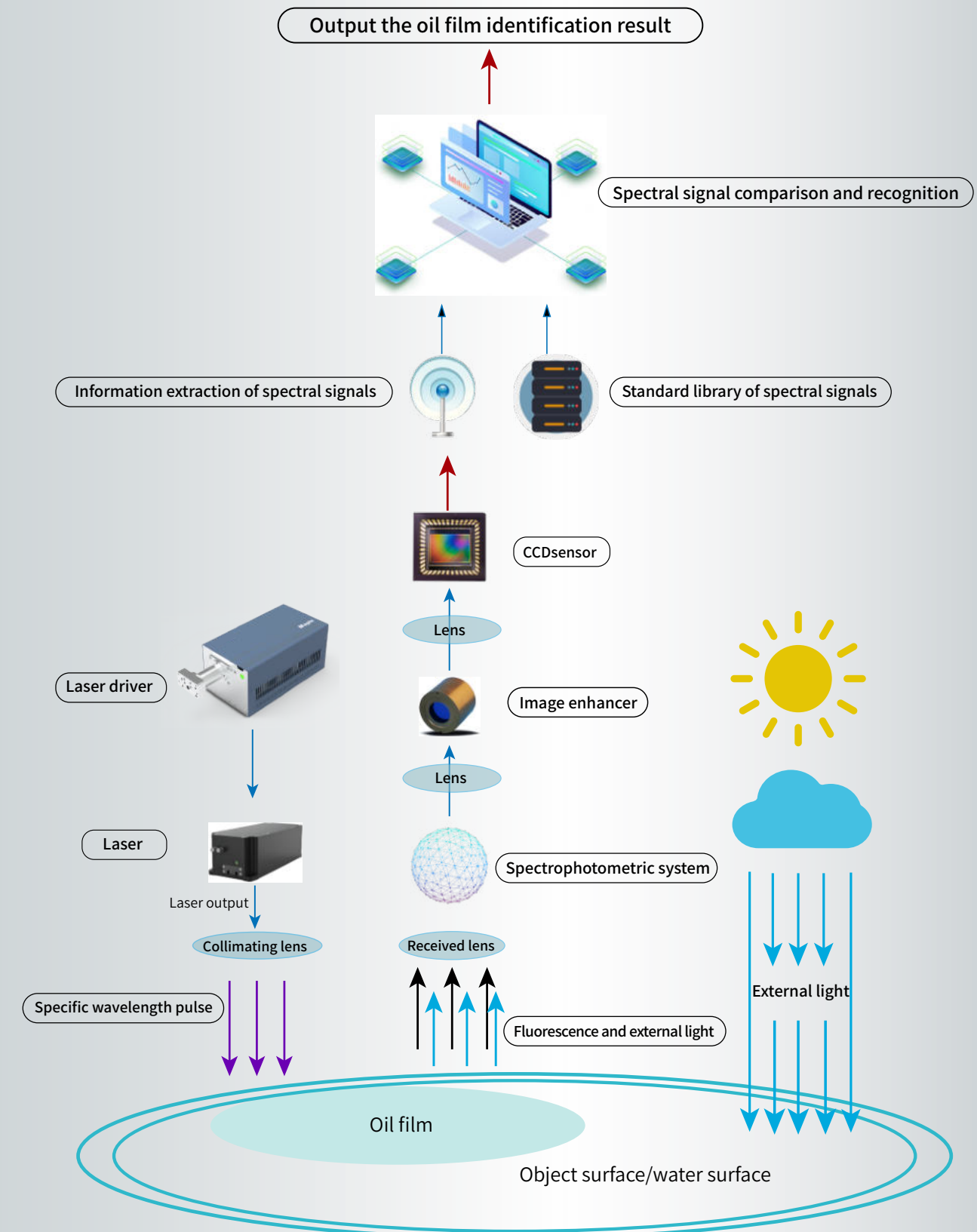
High accuracy

Optical harmonic analysis and Raman algorithm greatly improve the accuracy of oil pollution detection.

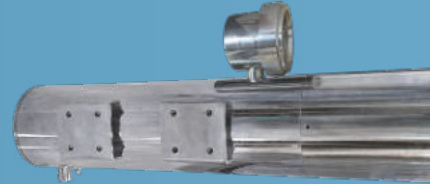
Non-contact

Remote, non-contact monitoring of the oil film on the water surface, monitoring distance 1-15/20/40m, easy to install.

System topology diagram



Explosion-proof oil spill detector camera



It adopts non-contact real-time monitoring, supports vertical down or 90° down tilt installation when installing, and is mostly used for offshore platforms.



Support 360°, $\pm 90^\circ$ no dead angle real-time monitoring, mostly used for offshore platforms, chemical plants, etc., can be installed point to point according to the field situation, support 0-10m detection distance.

Explosion-proof oil spill detector camera



Support 360°, $\pm 90^\circ$ no dead angle real-time monitoring, mostly used for offshore platforms, chemical plants, etc., can be installed point to point according to the field situation, can choose 0-20m or 0-40m detection distance.

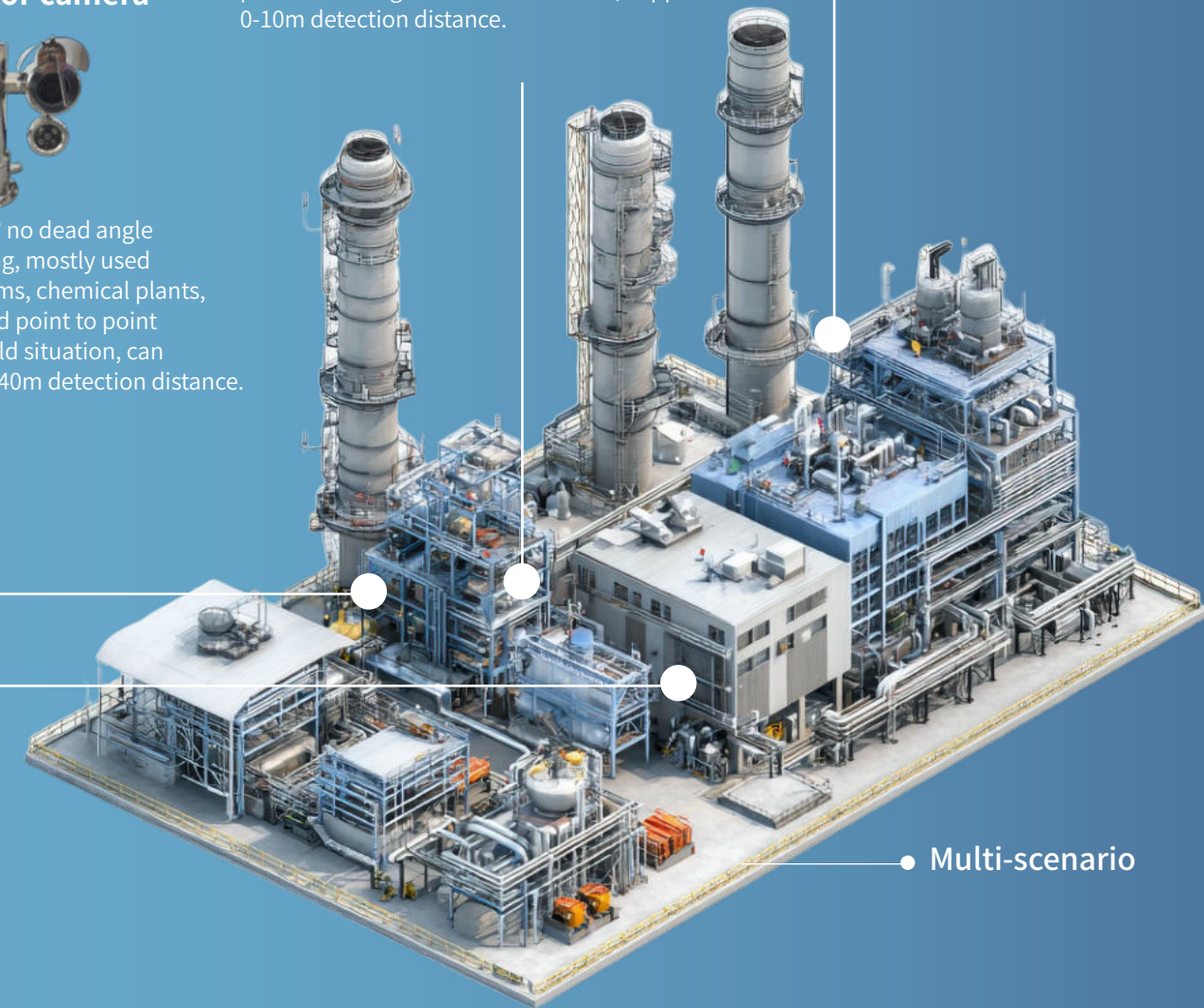
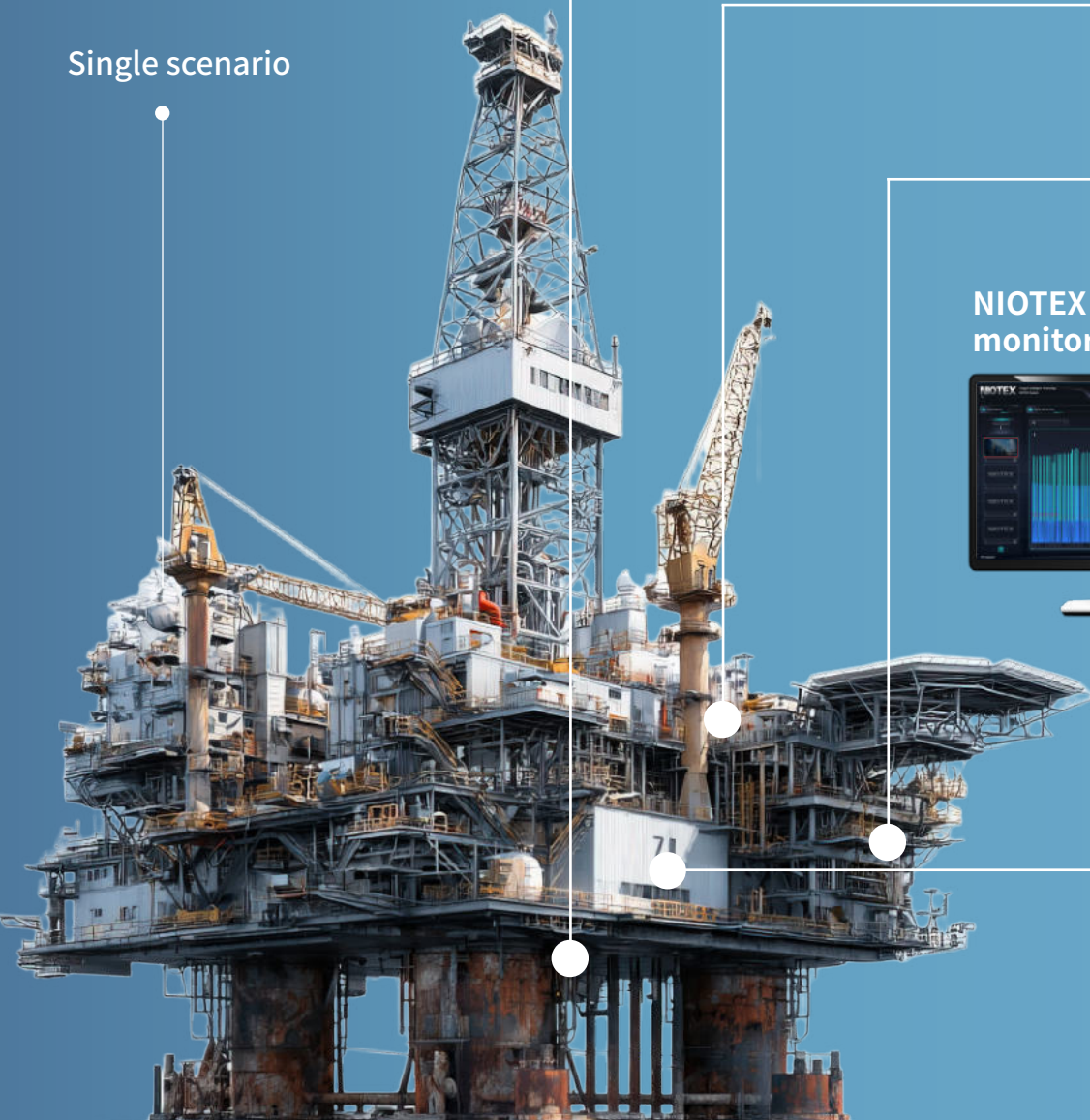
NIOTEX Oil spill monitoring workstation



Receive signals identified by oil spill detectors, up to 4 detectors can be connected. It is generally installed in the central control room or main switch room of the offshore platform, and the duty room of the chemical plant.

Single scenario

Multi-scenario

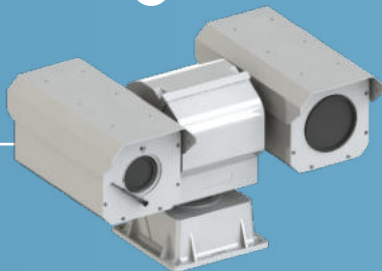


Application scenarios

NIOTEX Oil spill monitoring workstation



Receive signals identified by oil spill detectors, up to 4 detectors can be connected. It is generally installed in the central control room or main switch room of the offshore platform, and the duty room of the chemical plant.



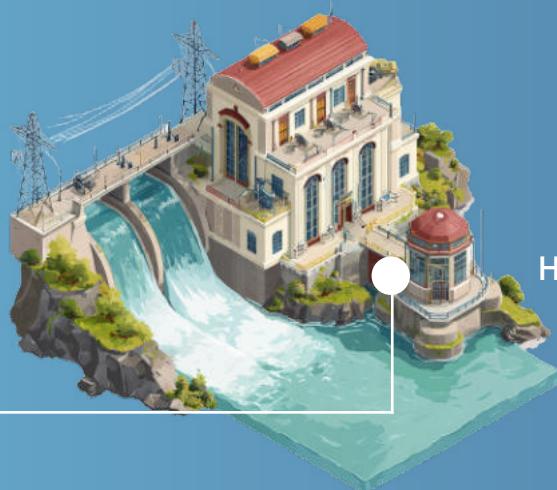
Oil spill detector camera

Support 360°, $\pm 90^\circ$ no dead angle real-time monitoring, mostly used in ports, docks and other places as shown in the figure, can be installed point to point according to the field situation, support 0-10m, 0-20m, 0-40m detection distance.

Port head/
wharf/
berth



Channel/Anchorage



Hydropower station

Refueling facilities



Industrial emissions



System Introduction

This software displays the monitoring images of the device in real time. When the device alarms, the software will take photos and videos of the oil pollution status on the sea surface at the time of the alarm, generate relevant alarm reports, and store them in a local folder for viewing at any time.

The software supports 4 language switches (Chinese, British, Russian,Arabic).

Corporate Logo

It can be customized according to specific needs.

Language switch

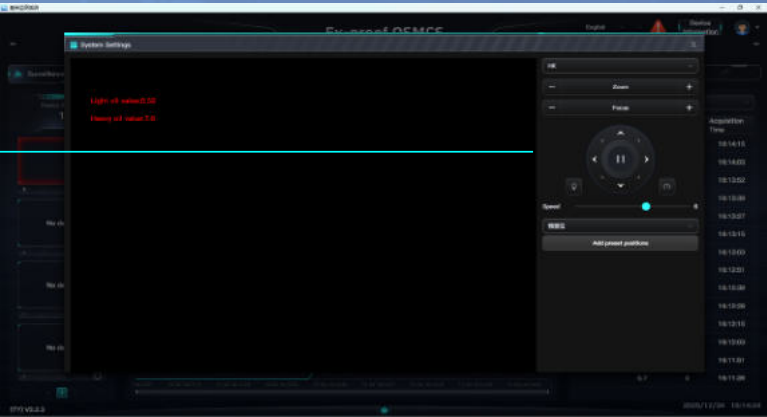
It can switch between 4 different language modes.

Alarm Flashing

When an oil spill alarm is detected, the icon will change from green to red for alarm prompt.

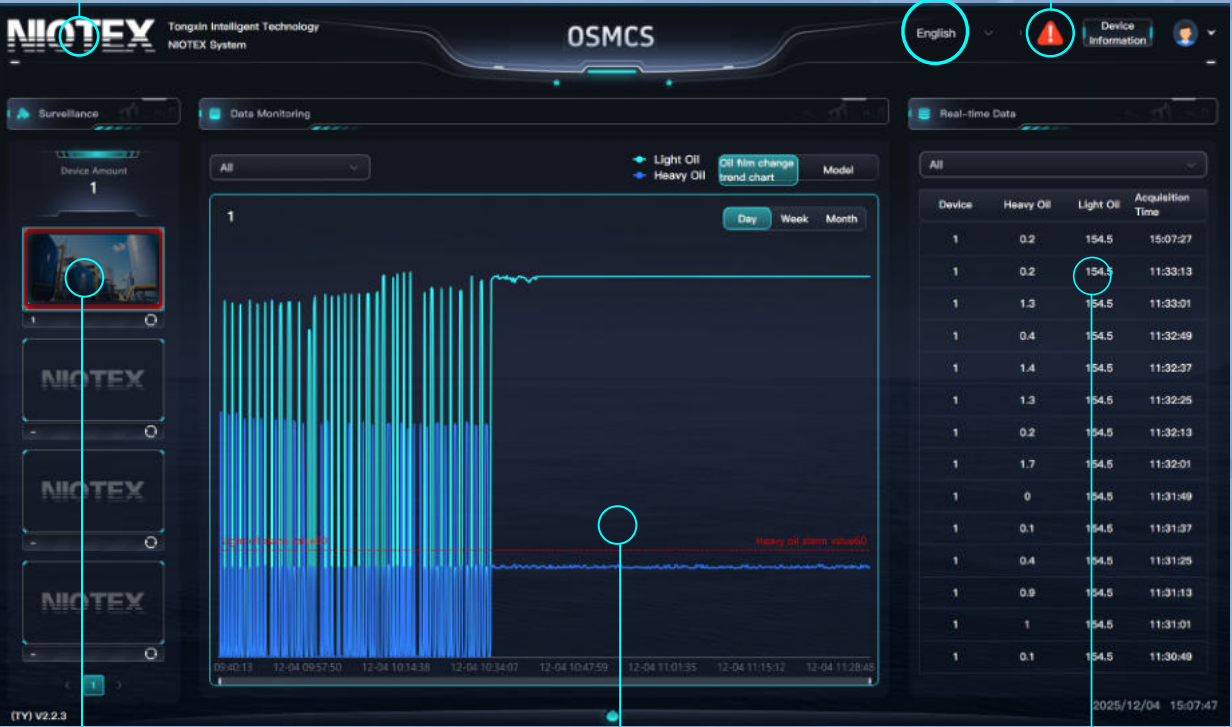
PTZ control

The preset position angle can be adjusted through the system monitoring interface, supporting a rotation range of $\pm 90^\circ$ vertically and 360° horizontally.



Alarm module

When the monitoring data of the explosion-proof oil spill detector camera exceeds the limit value, the software will trigger an alarm prompt and issue a sound alarm. Users can view the alarm information of the relevant equipment and, through the filtering function, check the alarm records for the corresponding date and corresponding equipment, including the incident report, alarm snapshot images, and alarm videos.



Real-time video surveillance

Browse the video footage in real-time under the monitoring status of the explosion-proof oil spill detector camera.

Real-time data curve

You can browse the dynamic change trend of oil spill monitoring data in real time.

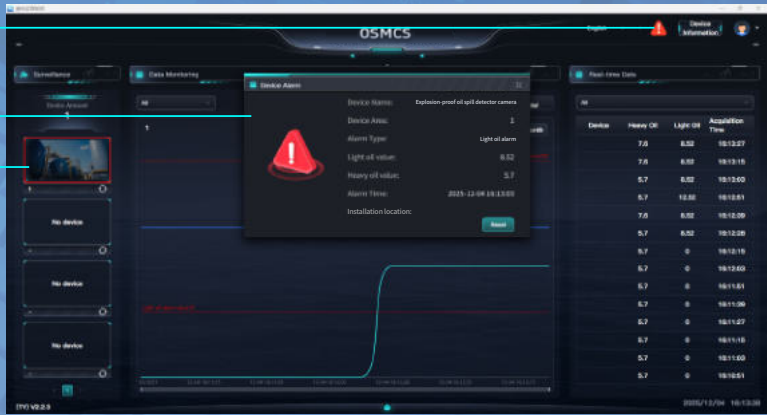
Real-time data list

Display the data detected by the device in real time, with an adjustable data collection cycle.

Alarm icon prompt

Alarm pop-up prompt+audible alarm

The monitoring window of the alarm area turns red



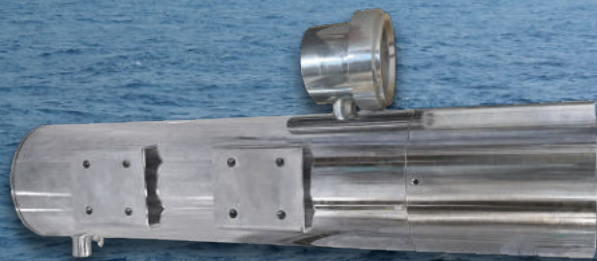
Alarm List

After triggering an alarm, users can view the alarm record information of the relevant equipment, including the alarm report, alarm snapshot images, and alarm videos.



Explosion-proof oil spill detector camera

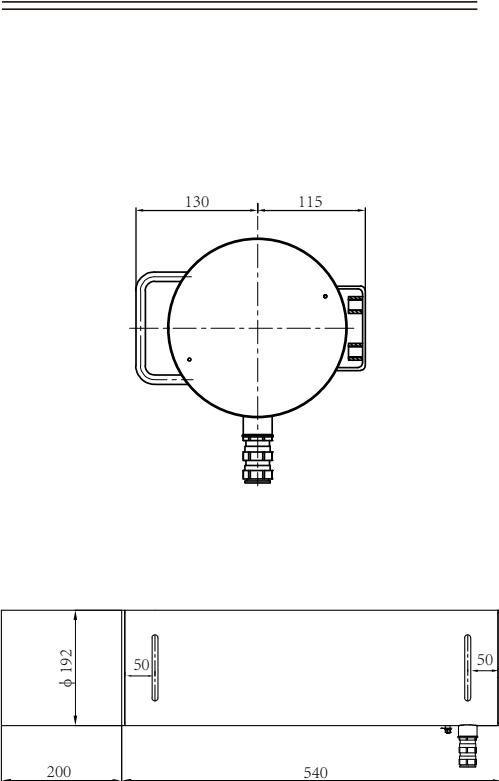
Using non-contact mode, real-time monitoring of oil pollution on the , high sensitivity and accuracy, fast response speed, and can react before the pollution spreads out of control. Provide all-weather, full time online monitoring of water pollution. It can meet the monitoring requirements of different application scenarios, different distances and different oils such as light oil/heavy oil.



Product specification

GB Ex-mark:	Ex db II C T6 Gb
CEEx Ex-mark:	Ex db II C T6 Gb; Ex tb IIIC T80°C Db
ATEX Ex-mark:	II 2G Ex db II C T6 Gb; II 2D Ex tb IIIC T80°C Db
Ambient Temperature:	-40°C~+60°C
IP Rating:	IP66/IP68 (The water depth is 2 meters, and the duration is 2 hours)
Rated Voltage:	AC220V/DC24V
Rated Current:	≤5A
Product Material:	Stainless steel 316L
Product Weight:	40kg
Connected Cable:	5mMarine armoured cable
Detection Range:	10-20m&20-40m, Two specifications are optional
Oil film type:	Heavy oil, light oil
oil film thickness:	1μm~30mm
Spectral Range:	400-800nm
Measuring Time:	2s
Laser Source:	Ultraviolet pulse semiconductor
Imaging Device:	1/2.8" CMOS Image sensor
Focal Length:	4.8mm~120mm
Minimum Illumination:	Color:0.05 lux @ (F1.6, AGC ON); Black and white:0.01 lux @ (F1.6, AGC ON)
Pixel:	2 Million

Product Dimension Drawing



Representantes / Distribuidores Autorizados

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Web: www.dastecsrl.com.ar

Explosion-proof oil spill detector camera

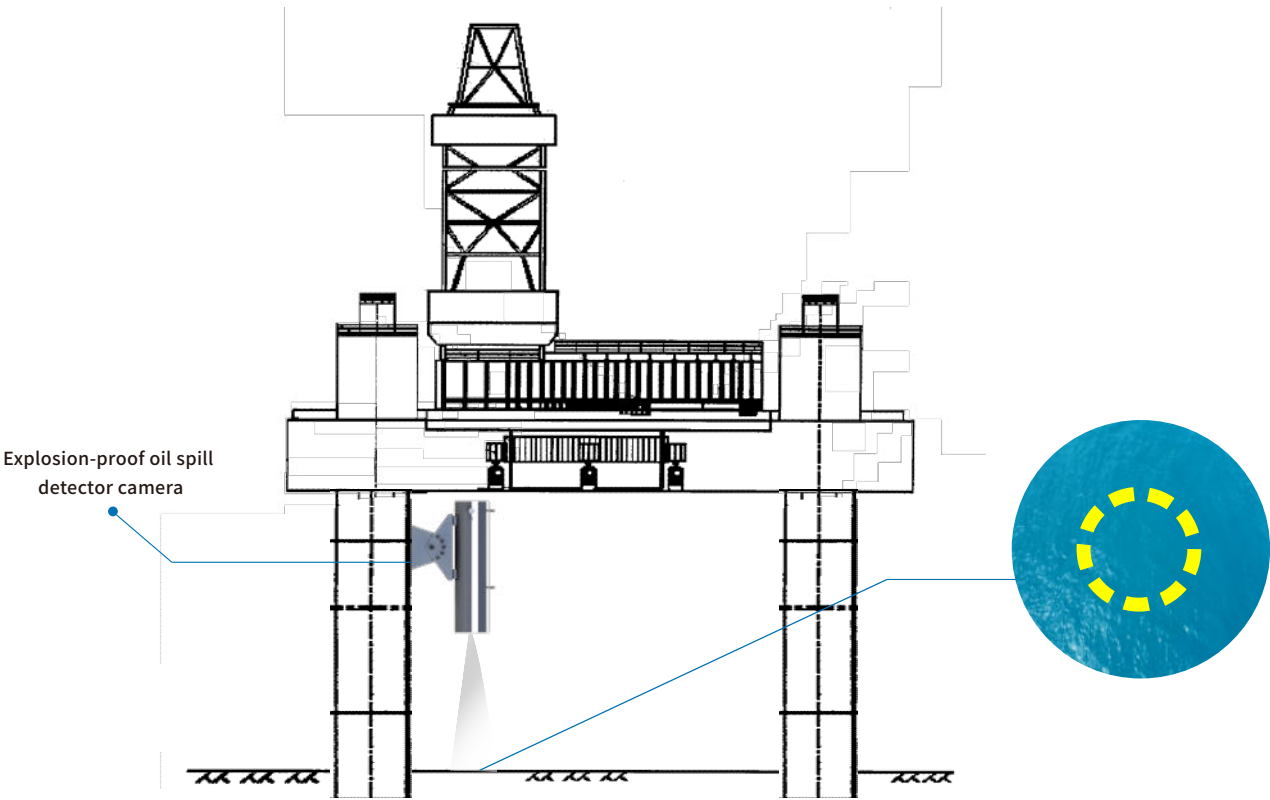
Product selection list

Product model	Order code	Product description
NT100-LS	A20	316L, IP66, oil film detection distance10-20m, 2 Million Pixel , single scenario
NT100-LS	A40	316L, IP66, oil film detection distance20-40m, 2 Million Pixel , single scenario
NT100-LD	A20	316L, IP66, oil film detection distance10-20m, 2 Million Pixel , Supports infrared light filling, single scenario
NT100-LD	A40	316L, IP66, oil film detection distance20-40m, 2 Million Pixel , Supports infrared light filling, single scenario

*Do not use in direct sunlight.

*The Angle between the camera's irradiation direction and the sea level is 60° to 90°.

Installation diagram



Explosion-proof oil spill detector camera

Using non-contact mode, real-time monitoring of oil pollution on the , high sensitivity and accuracy, fast response speed, and can react before the pollution spreads out of control. The PTZ supports horizontal 360° vertical -90°~+90° rotation, pro-viding all-weather, full time, wide range of online monitoring of water surface oil pollution. It can meet the monitoring require-ments of different application scenarios, different distances, different regions and different oils such as light oil/heavy oil.



Explosion-proof oil spill detector camera

Product selection list

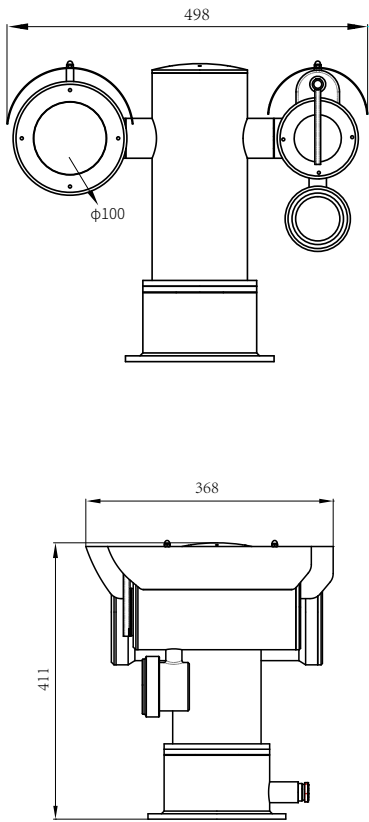
Product model	Order code	Product description
NT200-LD	A40	316L, IP66, oil film detection distance20-40m, 2 Million Pixel , Supports infrared light filling, single scenario
NT200-LD	C20	316L, IP66, oil film detection distance10-20m, 2 Million Pixel , Supports infrared light filling, multi-scenario

*Do not use in direct sunlight.
*The Angle between the camera's irradiation direction and the sea level is 60° to 90°.

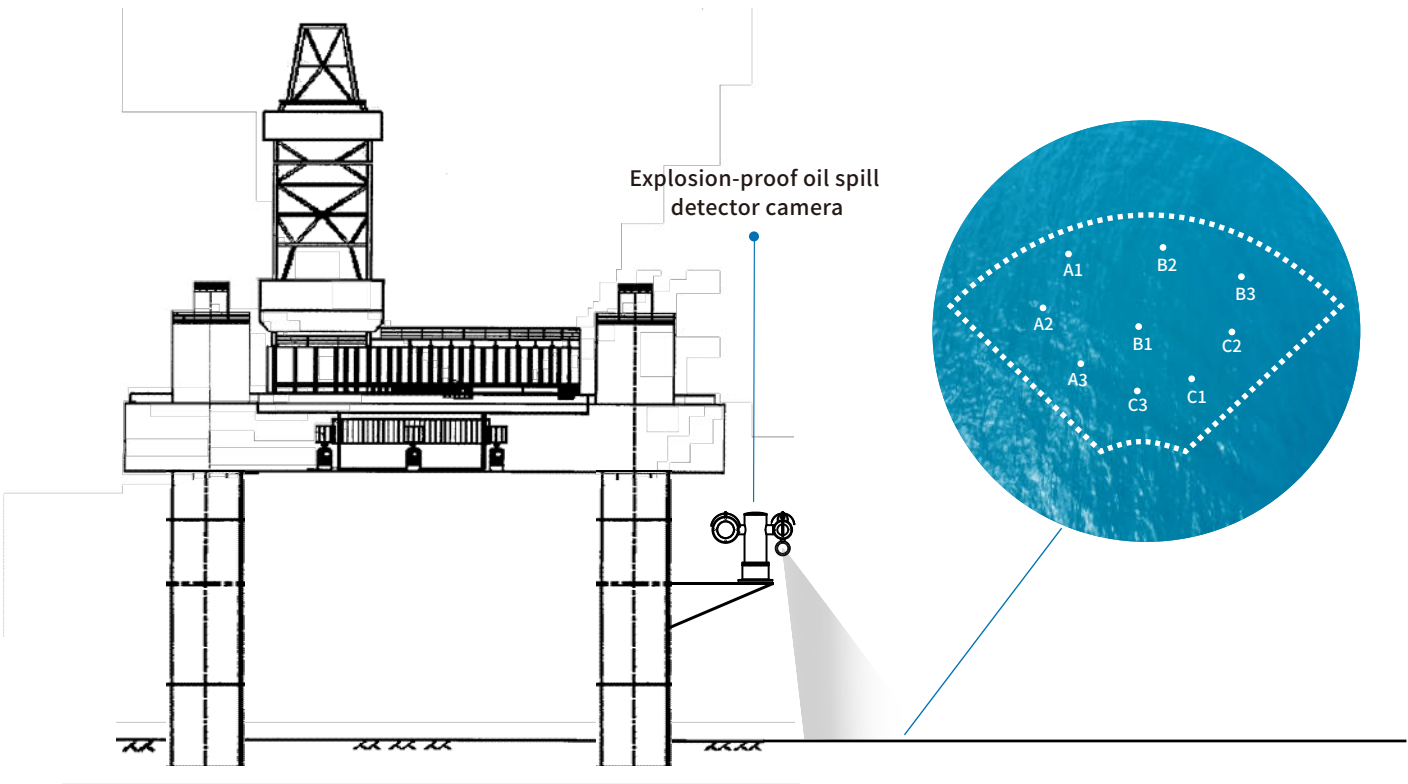
Product specification

GB Ex-mark:	Ex db II C T6 Gb
ECEx Ex-mark:	Ex db II C T6 Gb; Ex tb IIIC T80°C Db
ATEX Ex-mark:	Ⓔ II 2G Ex db II C T6 Gb; II 2D Ex tb IIIC T80°C Db
Ambient Temperature:	-40°C~+60°C
IP Rating:	IP66/IP68 (The water depth is 2 meters, and the duration is 2 hours)
Rated Voltage:	AC220V/DC24V
Rated Current:	≤5A
Rotation Range:	horizontal 360° vertical -90°±90°
Preset Point:	255pcs
Cruise Scan:	Support
Product Material:	Stainless steel 316L
Product Weight:	45kg
Connected Cable:	5mMarine armoured cable
Detection Range:	10-20m&20-40m, Two specifications are optional
Oil film type:	Heavy oil, light oil
Oil film thickness:	1μm~30mm
Spectral Range:	400-800nm
Measuring Time:	2s
Laser Source:	Ultraviolet pulse semiconductor
Imaging Device:	1/2.8" CMOS Image sensor
Focal Length:	4.8mm~120mm
Minimum Illumination:	Color:0.05 lux @ (F1.6, AGC ON); Black and white:0.01 lux @ (F1.6, AGC ON)
Pixel:	2 Million

Product Dimension Drawing



PTZ Inspection diagram



Explosion-proof oil spill detector camera

Using non-contact mode, real-time monitoring of oil pollution on the , high sensitivity and accuracy, fast response speed, and can react before the pollution spreads out of control. The PTZ supports horizontal 360° vertical -90°~+90° rotation, pro-viding all-weather, full time, wide range of online monitoring of water surface oil pollution. It can meet the monitoring require-ments of different application scenarios, different distances, different regions and different oils such as light oil/heavy oil.



Explosion-proof oil spill detector camera

Product selection list

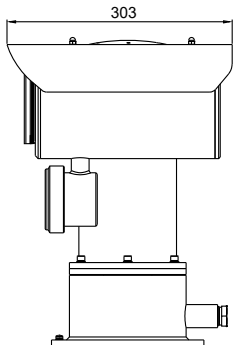
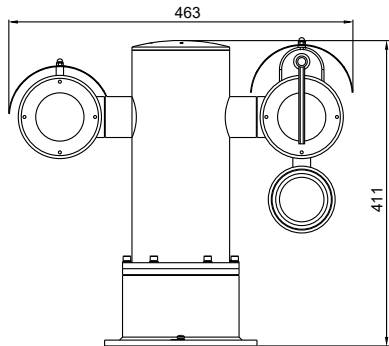
Product model	Order code	Product description
NT201-LS	A10	316L, IP66, oil film detection distance3-10m, 2 Million Pixel , Supports infrared light filling, single scenario

*Do not use in direct sunlight.
*The Angle between the camera's irradiation direction and the sea level is 60° to 90°.

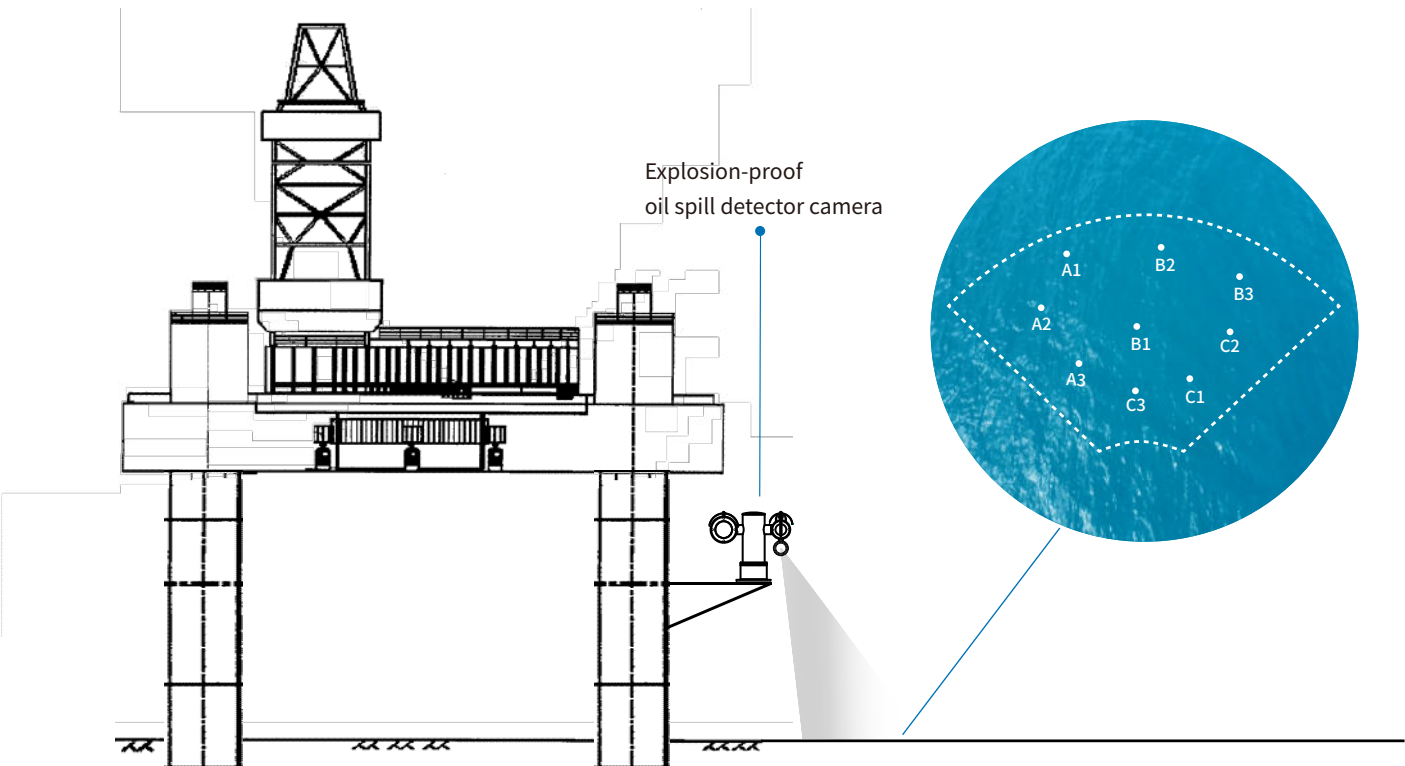
Product specification

GB Ex-mark:	Ex db II C T6 Gb
ECEX Ex-mark:	Ex db II C T6 Gb;Ex tb IIIC T80°C Db
ATEX Ex-mark:	⊕ II 2G Ex db II C T6 Gb; II 2D Ex tb IIIC T80°C Db
Ambient Temperature:	-40°C~+60°C
IP Rating:	IP66
Rated Voltage:	AC220V/DC24V
Rated Current:	≤5A
Rotation Range:	Horizontal 360° Vertical -90°±90°
Preset Point:	255pcs
Cruise Scan:	Support
Product Material:	Stainless steel 316L
Product Weight:	25kg
Connected Cable:	5mMarine armoured cable
Detection Range:	3-10m
Oil film type:	Heavy oil, light oil
Oil film thickness:	1µm~30mm
Spectral Range:	400-800nm
Measuring Time:	2s
Laser Source:	Ultraviolet pulse semiconductor
Imaging Device:	1/2.8" CMOS Image sensor
Focal Length:	2.8mm~12mm
Minimum Illumination:	Color:0.05 Lux @ (F1.6, AGC ON); Black and white:0.01 lux @ (F1.6, AGC ON)
Pixel:	2 Million

Product Dimension Drawing

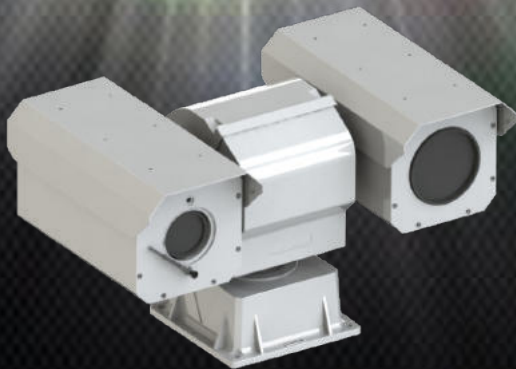


PTZ Inspection diagram



Oil spill detector camera

Using non-contact mode, real-time monitoring of oil pollution on the , high sensitivity and accuracy, fast response speed, and can react before the pollution spreads out of control. The PTZ supports horizontal 360° vertical -90°-+90° rotation, pro-viding all-weather, full time, wide range of online monitoring of water surface oil pollution. It can meet the monitoring require-ments of different application scenarios, different distances, different regions and different oils such as light oil/heavy oil.



Product specification

Ambient Temperature:	-40~+70℃
Ambient Humidity:	≤90%RH
IP rating:	IP66
Rated Voltage:	AC220V
Rated Power:	≤120W
Product Material:	Aluminum alloy
Product Weight:	25kg
Oil film type:	Heavy oil, light oil
Oil film thickness:	1μm~30mm
Laser Source:	Ultraviolet pulse semiconductor
Laser pulse modulation:	support
Laser Wavelength:	405nm
Inspection Cycle:	2s

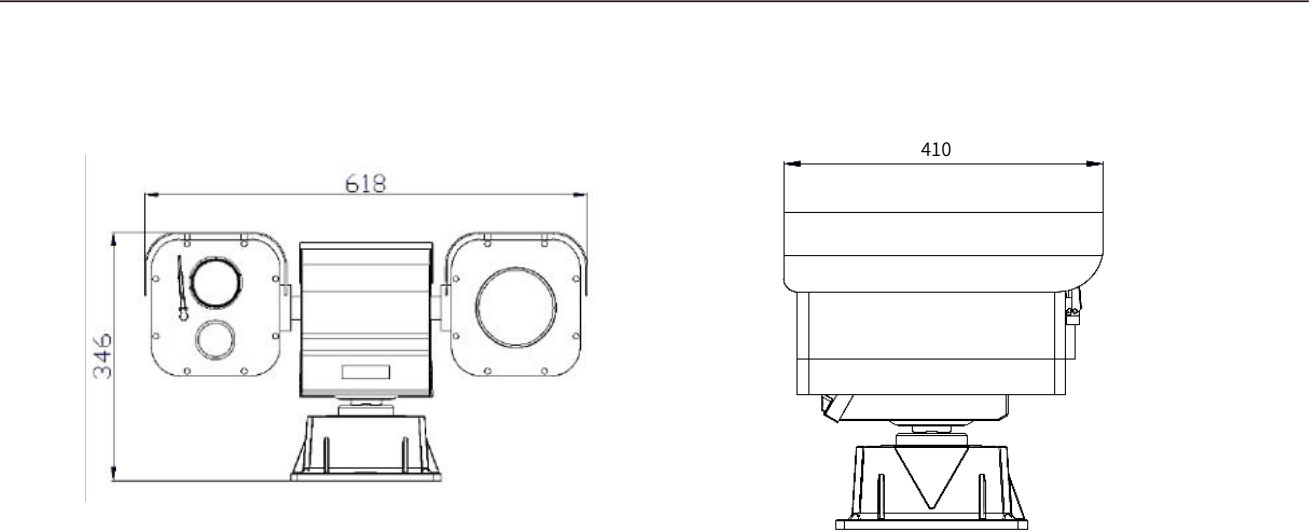
Oil spill detector camera

Product selection list

Product model	Order code	Product description
MT200-LD	A10	IP66, 3-10m Oil spill detection distance, single scenario
MT200-LD	A20	IP66, 10-20m Oil spill detection distance, single scenario
MT200-LD	A40	IP66, 20-40m Oil spill detection distance, single scenario

*Do not use in direct sunlight.
*The Angle between the camera's irradiation direction and the sea level is 60° to 90°.

Product Dimension Drawing



Oil spill monitoring station

Equipped with high-performance processor, large-capacity memory, gigabit network switch, embedded hard disk video recorder, built-in spectral analysis algorithm and Raman algorithm, with the use of self-developed fusion monitoring system and oil spill detector, it can realize the real-time monitoring function of on-site oil spill location and the back-end management function of field equipment. 24-hour real-time monitoring, with high intelligent analysis, quick response and timely alarm, high temperature resistance and low temperature resistance characteristics. The server can support up to 4 monitoring devices connected at the same time.

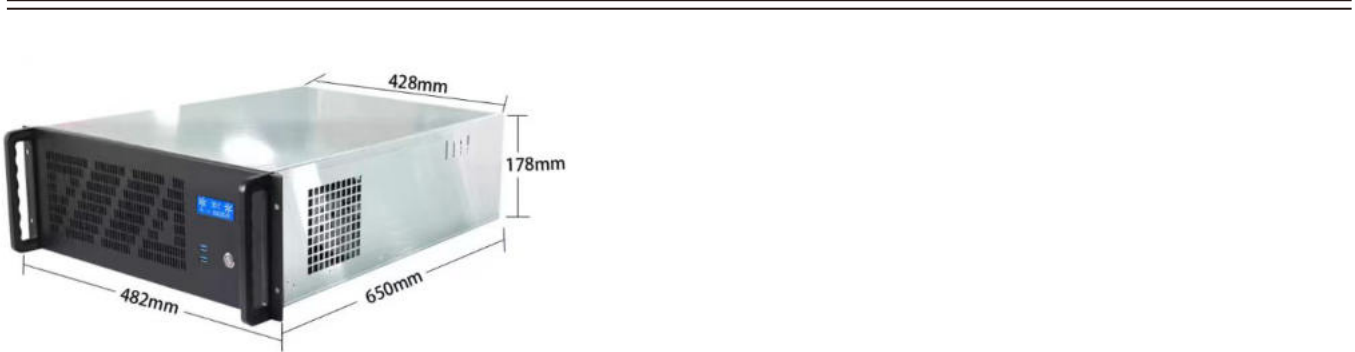


Configuration

Ambient Temperature:	0°C~+40°C
Product Weight:	19kg
Product Dimensions:	Device dimensions: 482×650×178mm; Installation dimensions: 482×720×178mm
CPU:	10 core 16 threads, single-core frequency up to 4.6Ghz, 20M level 3 cache
Internal Storage:	16GB DDR5
Mechanical hard disk:	1T
Mainboard:	ASUS
Displayer:	24 inches
Keyboard and mouse:	Support
Sound:	Support
Power Supply:	Full module for industrial control
Software and hardware:	Equipped with high-performance processor, large capacity memory, and built-in oil spill monitoring and management software.

* The above parameters are standard system configurations. The actual system server configuration needs to be adjusted according to the specific circumstances of the project.

Product Dimension Drawing



Explosion-proof control box

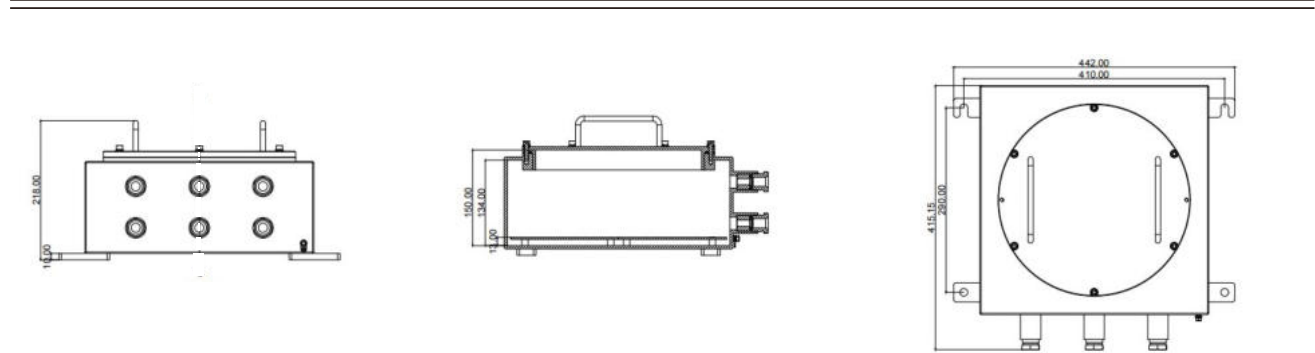
It is equipped with functional modules such as lightning protection, surge protection, photoelectric network and wiring. If it is connected to an explosion-proof sound and light alarm, it can issue on-site alarm prompts when oil leakage occurs.



Product specification

GB Ex-mark:	Ex db II C T6 Gb/Ex tb IIIC T80°C Db
CEEx Ex-mark:	Ex db IIC T6 Gb; Ex tb IIIC T80°C Db
ATEX Ex-mark:	Ⓔ II 2 GD Ex db IIC T6 Gb Ex tb IIIC T80°C Db
Ambient Temperature:	-40°C~+60°C
IP Rating:	IP68
Accessory Material:	Stainless steel 316L
Internal space dimensions:	350×350×150mm
Cable Entry:	Up to 6*M20 or M25 outlet can be selected, all are down exits
Installation Method:	Wall, fixed bracket, column, platform

Product Dimension Drawing



Explosion-proof junction box

Gas dust explosion-proof dual certification, suitable for explosive gas environments in Zone 1 and Zone 2, as well as combustible dust environments in Zone 21 and Zone 22. The box body is designed with an independent grounding device. The cables are connected to the interior of the box through explosion-proof connectors. Electrical equipment such as air switches, optical transceivers, optical terminal boxes, and switching power supplies can be installed. An explosion-proof sound and light alarm device can be externally connected as an alarm equipment. When fiber optic transmission and on-site alarm are required, it can be used in conjunction with explosion-proof oil spill detector cameras.

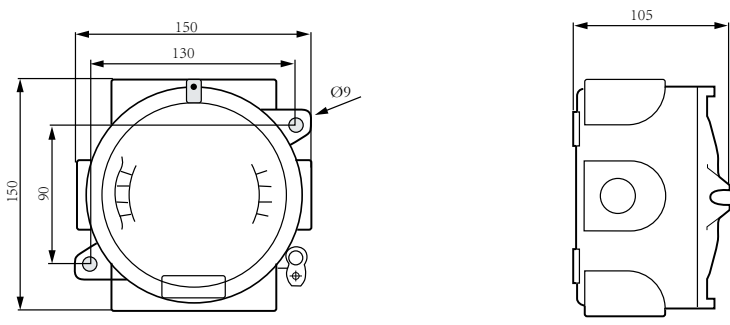


Product specification

GB Ex-mark:	Ex db IIC T6 Gb, Ex tb IIIC T80°C Db
CEEx Ex-mark:	Ex d IIC T6, Ex td A21 IP67 T85°C
ATEX Ex-mark:	Ex II 2 GD Ex d IIC T6 Ex td A21 T85°C
IP Rating:	IP67
Ambient temperature:	-20°C~+55°C
Rated Voltage:	max. 750V
Shell Material:	Tainless steel 316L
Wiring Method:	4×M25
Terminal Block:	Weidmüller 2.5mm²×6, guide rail size is 110mm

*The standard specifies that the minimum ambient temperature for the product is -20°C. Certified products that can withstand the minimum ambient temperature of -50°C are also available, but special requirements must be confirmed with the salesperson during the inquiry and order process.

Product Dimension Drawing





Representantes / Distribuidores Autorizados

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Web: www.dastecsrl.com.ar

Project Introduction

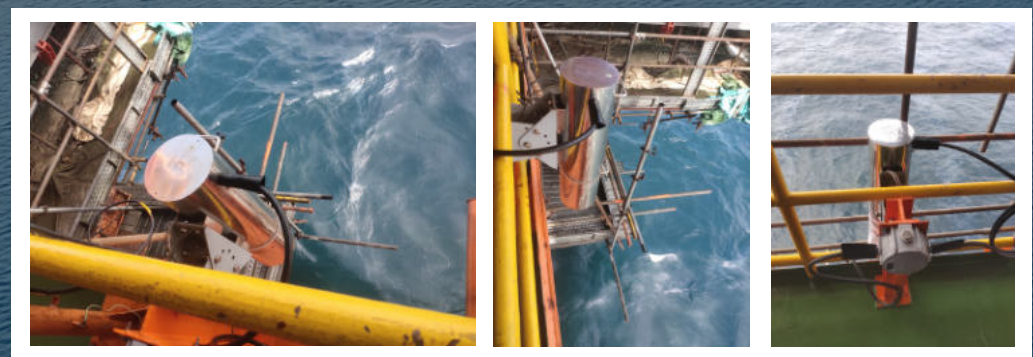
The 2022 Bohai Sea Offshore Platform Oil Spill Monitoring Project



The 2025 South China Sea Offshore Platform Oil Spill Monitoring Project



The 2025 East China Sea Offshore Platform Oil Spill Monitoring Project



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