BOSCH

FCS-8000-VFD-I AI-VFD Bullet 4MP 4.4-10mm IP67
AVIOTEC 8000i IR

- ▶ Starlight X technology for next level low-light performance with maximum detail
- ▶ Powerful long range (850nm) smart IR illumination up to 80 m
- ▶ Extremely robust and stable design with exceptional corrosion resistance for any outdoor application
- ▶ Covers large monitoring area
- ▶ Robust against false alarms
- ▶ Very fast and reliable fire and smoke detection

Video-based fire detection is the system of choice when reliable video motion fire detection is needed. It operates as stand-alone unit and does not need a separate evaluation unit. Subject to the installation and operating conditions explained in the documentation, it can, for example, supplement traditional fire detection systems or provide means of fire detection where traditional fire detection systems are technically limited.

AVIOTEC 8000i IR can be used as primary fire detection system when the application is not covered by any code of practice or other kind of standards or if the necessary approvals/releases have been obtained for the intended applications in accordance with the applicable laws and other regulations.

The FCS-8000-VFD-I is an extremely robust bullet camera for mission-critical applications. The ruggedized and stable design has exceptional corrosion resistance for use in any outdoor application.

Using 1/1.8" sensors with 4MP resolution, the FCS-8000-VFD-I provides the perfect balance between high resolution and extreme low light sensitivity.

Starlight X technology combined with powerful smart IR illumination ensure highly detailed images even in the most challenging situations.

The cameras have a powerful, embedded processor with dedicated hardware to support advanced machine learning and deep neural networks.

AVIOTEC 8000i IR allows easy configuration and monitoring through network devices such as Client PCs or mobile devices. A video recording management system may be integrated optionally. Furthermore, there is a relay output to transmit alarm signals, e.g. to the AVENAR panel. In this case the camera acts as supervisory signal-initiating device. Alarms have to be verified by an operator in a monitoring center owing to non-existing standards. Automatic alarm-forwarding to fire services is not provided.

Functions

Fast and reliable flame and smoke detection
The smoke and flame algorithm analyzes video frames by means of characteristic spatio-temporal patterns and variables. The core of the detection algorithm is a Deep Learning Network which was trained on a large-scale internal database, which is representative of the use cases of a Video-based Fire Detection System. The fast detection algorithm is based on a real-time image processing on the camera firmware.

The video-based fire detection works under remarkable low-light performance (down to 1 or 0 lx with the internal IR illumination) and detects test fires TF1 to TF8. In case of flame or smoke detection the video broadcast has the advantage to verify the alarm, speed up the rescue chain and give insights to rescue teams.

Monitoring large areas

Insensitive to dust and humidity thanks to the optical principle, it is possible to monitor large indoor and sheltered outdoor areas that push conventional systems to their limits. AVIOTEC 8000i IR is the innovative solution for:

• Industry
• Transportation
• Energy & Utilities
• Warehouses

Large application range

The video-based fire detection is suitable for a range of challenging applications in harsh environments with a high fire hazard like paper mills. Highly versatile in application, AVIOTEC 8000i IR offers the possibility to complement existing systems or to tap into new application fields.

Individually adjustable and adaptable

Verification time, sensitivity, detection size and selective masking for smoke and flame are individually configurable to adjust them to the customer needs. Flame and smoke detection can be activated or deactivated separately.

Root cause analysis

Connecting the camera to a video management system offers the possibility to find out the cause of fires. Based on video recordings, incidents can carefully be established and evaluated. This helps eliminating and preventing hazardous situations in the future.

Starlight X - Next level starlight performance

Starlight X technology combines the latest high performance, large pixel sensors, optics, improved image processing and noise suppression, resulting in a 5.5x improved sensitivity compared to the standard starlight camera.

IR illumination

The camera offers integrated advanced intelligent IR illumination. The IR range covers a distance of up to 80 m (262 ft).
The combination of multiple IR beam angles, linked to the zoom position of the lens, ensure uniform illumination of the full scene, without hot spots or dark corners in any field of view. Intelligent IR ensures a balanced image without over exposure on objects closer to the camera.

H.265 high-efficiency video encoding

The camera is designed on the most efficient and powerful H.264 and H.265/HEVC encoding platform. The camera is capable of delivering high-quality and high-resolution video with low network load.
With a doubling of encoding efficiency, H.265 has become the new compression standard of choice for IP video surveillance systems.

Resists rain, dust, and tampering with reliable operation across a wide temperature range

Suitable for indoor and outdoor usage.
The robust design of the camera is rated to IP66 / IP67 and IK10 standards, safeguarding the camera against rain and dust while also offering protection against vandalism and tampering.
The camera can operate in a wide ambient temperature range between -50 °C up to +60 °C.

Easy installation

The FCS-8000-VFD-I uses the proven 3-step installation concept. The mounting plate has multiple hole patterns for installation. The back box can be attached with a simple rotate and click. All wires can be connected in the back box.
Power can be supplied through Power-over-Ethernet. With this configuration, only a single cable connection is required to view, power, and control the camera. Using PoE makes installation easier and more cost effective, as cameras do not require a local power source.
The design of the camera focuses on robustness and stability. A patented optimized swivel design further helps with the ease of installation.
The swivel has a big-ball joint for optimal stability. The camera features a short housing and a big swivel, to ensure maximum stability.

Advanced edge recording

Advanced edge recording provides the storage solution possible due to the combination of the following functionalities:
• Dual microSD cards that can be set up as either:
  – Mirrored, for redundant storage
  – Failover, for extended service intervals
  – Extended, for maximum retention time
• Industrial microSD card support allows for extreme lifetime
• Health monitoring of industrial microSD cards provide early service indications

Cloud-based services

The camera supports time-based or alarm-based JPEG posting to four different accounts. These accounts can address FTP servers or cloud-based storage. Video clips or JPEG images can also be exported to these accounts.
Alarms can be set up to trigger an e-mail or SMS notification so you are always aware of abnormal events.

Regulatory information	
Type	**Standard**
Emission	EN 55032 (Class B)
	EN 50121-4
	EN IEC 61000-6-3
	EN IEC 61000-6-4

Type	Standard
	CFR 47 FCC part 15 (Class B)
	ICES-003 Issue 7
Immunity	EN 55035
	EN 50130-4
	EN 50121-4
	EN IEC 61000-6-1
	EN IEC 61000-6-2
	EN 61000-4-2
	EN 61000-4-3
	EN 61000-4-4
	EN 61000-4-5
	EN 61000-4-6
	EN 61000-4-8
Environmental	EN 50130-5 (Class IV)
	EN 60068-2-2
	EN 60068-2-5
	EN 60068-2-6
	EN 60068-2-18
	EN 60068-2-27
	EN 60068-2-30
	EN 60068-2-42
	EN 60068-2-52
	EN 60068-2-75
	EN 60068-2-78
	TS 2-2003, Section 2 (Environmental requirements)
	EN IEC 63000 (RoHS)
	California Proposition 65
Corrosion resistance	ISO 14993
Safety	IEC 62368-1
	EN 62368-1
	UL 62368-1
	CSA C22.2 No. 62368-1
	IEC 60950-22
	EN 60950-22
	UL 60950-22
	CSA C22.2 No. 60950-22
	IEC 62368-3
	EN IEC 62368-3
	IEC 62471
	EN 62471
Impact protection	EN 62262 (IK10)

Type	Standard
Ingress protection	EN 60529 (IP66/IP67)
	NEMA 250 (4X)
ISO 20653	IP6K9K
Marks	CE, cULus, RCM, WEEE, VCCI, CMIM, UKCA
Compliance	NDAA compliant

| Region	Regulatory compliance/quality marks	
Europe	CE	FCS-8000-VFD-I
Morocco	CMIM	FCS-8000-VFD-I

Installation/configuration notes

IMPORTANT: Video fire indication systems are video content analysis systems. They give indications for possible fires and are designed to supplement fire detection systems and human guards in monitoring centers in order to recognize possible dangerous situations.

Video fire indication systems are confronted with a higher amount of challenges considering scenery and background compared to conventional fire detection systems. They cannot ensure that fire will be detected reliably in all scenery settings. Thus, the video fire detection system shall be seen as a support system that enhances the probability of early fire detection, with the restriction that it shall not be seen as a system that ensures fire detection in all possible image scenarios and it might detect false alarms. Conventional fire alarm systems must in no way be replaced by video-based fire alarm systems.

In addition, and for the U.S. market only, Bosch Security Systems makes no representation that the video fire indication system will prevent any personal injury or property loss by fire or otherwise; or that such product will in all cases provide adequate warning or protection. Buyer understands that a properly installed and maintained fire indication system may only reduce the risk of a fire or other events occurring without providing an alarm, but it is not insurance or a guarantee that such will not occur or that there will be no personal injury or property loss as a result.

Consequently, Bosch Security Systems shall have no liability for any personal injury, property damage or other loss based on a claim the product failed to give warning.
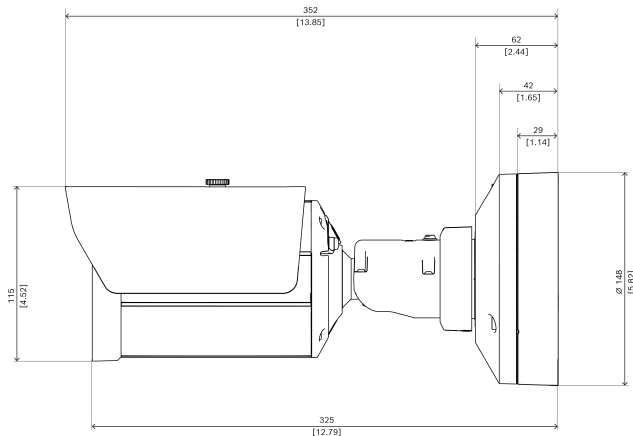
Dimensions in mm (inch)
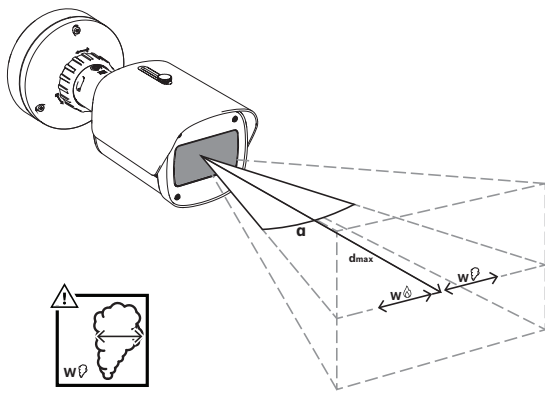
α				
	100º	**90º**	**60º**	**48.5º**
w🔥	**dmax**			
0.3m	11.4m	13.6m	23.6m	30.2m
0.5m	19.0m	22.7m	39.3m	50.4m
0.75m	28.6m	34.0m	59.0m	75.6m
1m	38.1m	45.4m	78.7m	100.9m
1.25m	47.6m	56.8m	98.4m	126.1m
1.5m	57.2m	68.1m	118.0m	151.3m

α				
	100º	**90º**	**60º**	**48.5º**
w🕯	**dmax**			
0.3m	7.8m	9.3m	16.2m	20.8m
0.5m	13.1m	15.6m	27.0m	34.6m
0.75m	19.6m	23.4m	40.5m	52.0m
1m	26.2m	31.2m	54.1m	69.3m
1.25m	32.7m	39.0m	67.6m	86.7m
1.5m	39.3m	46.8m	81.1m	104.0m

For further information refer to user manual and planning manual on: https://www.boschsecurity.com

Parts included

Quantity	Component
1	FCS-8000-VFD-I
1	TR20 key
1	Mini screwdriver

Quantity	Component
1	Grommet (IP66)
1	Grommet (IP67)
1	Quick installation guide
3	Installer UX labels

Technical specifications

Electrical

Algorithm Overview

Min. detection size for Smoke, standard setting (% of picture width)	1.6
Smoke speed (% of picture height/s)	0.5 - 16
Smoke speed (% of picture width/s)	0%-30%
Min. Smoke density (%)	needs to be visible in the picture
Min. detection size for Flame, standard setting (% of picture width)	1.1
Min. illumination level (lx)	1
Min. illumination level with IR illumination (lx)	0
Max. illumination level for flame detection (lx)	20,000

PoE input	PoE IEEE 802.3af / 802.3at Type 1, Class 3; PoE and auxiliary power can be connected simultaneously for redundant operation
Input voltage (VAC)	24 VAC ±10%
Input voltage (VDC)	12 VDC – 26 VDC ±10%
Power consumption PoE (W) (typical – maximum)	7 W – 12.95 W
Power consumption VAC (W) (typical – maximum)	7.10 W – 13 W
Power consumption VDC (W) (typical – maximum)	7.50 W – 16 W

Sensor

Sensor type	1/1.8 inch CMOS
Effective pixels (H x V px)	2688 x 1520; 2.9 µm

Total sensor pixels	4.10 MP approx.

Sensitivity

Low light technology	starlight X
Sensitivity	30 IRE
Color (lx) (sensitivity according to IEC 62676 Part 5)	0.009 lx
Monochrome (lx) (sensitivity measured according to IEC 62676 Part 5)	0.0012 lx (0 with IR)
High Dynamic Range (HDR) (dB)	141 dB

Optical

Lens focal length (mm)	4.70 mm – 10 mm
Iris control	P-iris
IR corrected	Yes
Lens aperture (/F)	1.35 /F – 1.97 /F
Zoom/focus control	Motorized
Field of View wide (H x V)	103° x 53°
Field of View tele (H x V)	48° x 27°

Night vision

IR function	On; Off; Auto; Intelligent IR
LED	850 nm
Distance 850 nm IR (m)	Max. 80 (To be tested in application!)

Firmware

Common Product Platform	CPP14

Video streaming

Video compression	H.264 (ISO/IEC 14496-10); M-JPEG; H.265/HEVC
Sensor modes	60 fps, 2688 x 1520 (4.1 MP)
Streaming	4 configurable streams in H.265; H.264 and M-JPEG; Configurable framerate and bandwidth; Bosch Intelligent Streaming (available with future firmware update)
Camera processing latency	<67ms (60 fps)

GOP structure	IP; IBP; IBBP
Frame rate (fps)	1 fps – 60 fps
Video signal-to-noise ratio (dB)	>55 dB
Video Resolution	4.1 MP 2688 x 1520; HD 1080p 1920 x 1080; 1.3 MP 1536 x 864; HD 720p 1280 x 720; SD 432p 768 x 432; 0.1 MP 512x288

Camera installation

Mirror image	On; Off
Image rotation	0°, 180°
Camera LED	Auto disable; Enable; Disable

Video functions

ALC mode	Standard; Fluorescent
Shutter modes	Automatic Electronic Shutter (AES)
Day/night modes	Auto
White balance (K)	2,000 K – 10,000 K
White balance modes	Basic; Standard; Sodium vapor; Manual mode; Hold mode; 3 automatic modes
Number of privacy masks	8
Display stamping	Name; Logo; Alarm message; Time

Storage

Internal storage	5-s-pre-alarm-recording
Memory card slot	Dual micro SDHC; Dual micro SDXC; Dual micro SD card up to 2 TB
Industrial SD cards	Extreme lifetime and health monitoring support that provides early service indication
Dual SD-card slot configurations	Mirror (redundant storage); Failover (extended service interval); Extend (maximum retention time); Automatic Network Replenishment

Inputs and outputs

Ethernet	Shielded RJ45; Punch down connector
Audio line in	10 kOhm typical; max. 1 Vrms
Audio line out	1.5 kOhm typical; 1 Vrms
Alarm inputs	2; Dry contact; 5 - 40 VDC; 2.2 K end-of-line resistor
Alarm outputs	2 max 30 VAC; +40 VDC; 0.5 A; continuous 10 VA
Surge protection	1 kV; 1 kA to ground (8/20 µs)
USB	USB 2.0 Type C, for use with wireless USB dongle for setup and commissioning (sold separately)
Fiber optics (sold separately)	The Fiber Optic Ethernet Media Converter kit (VG4-SFPSCKT) installed inside a Surveillance Cabinet (NBA-7070-PA0, NBA-7070-PA1 or NBA-7070-PA2) provides the fiber optic interface to the mounted camera

Audio

Compression and sampling rate	AAC-LC 48kbps 16 kHz
Minimum signal-to-noise ratio (dB)	>50 dB
Audio streaming	Full duplex; Half duplex

Network

Protocols / standards	IPv4; IPv6; UDP; TCP; HTTP; HTTPS; RTP/RTCP; IGMP V2/V3; ICMP; ICMPv6; RTSP; FTP; ARP; DHCP; APIPA (Auto-IP, link local address); NTP (SNTP); SNMP (V1, MIBII); SNMP (V3, MIBII); DNS; DNSv6; DDNS (DynDNS.org, selfHOST.de, no-ip.com); SMTP; iSCSI; UPnP (SSDP); DiffServ (QoS); LLDP; SOAP; CHAP; Digest authentication
Ethernet type	10/100BASE-T
Conformity	ONVIF Profile S; ONVIF Profile G; ONVIF Profile T; ONVIF Profile M

Data security

Crypto coprocessor (TPM)	RSA 4096 bit; AES/CBC 256 bit
PKI	X.509 certificates
End-to-end encryption	Full end-to-end with supported VMS
Encryption	TLS 1.2; AES 256; AES 128; TLS 1.3
Local storage encryption	XTS-AES
Video authentication	MD5; SHA-1; SHA-256; Checksum
Firmware protection	Signed firmware; Secure boot; Software sealing

Mechanical

Material	Housing: Aluminum with dehumidifying membrane and waterproof connection area
Dimensions (Ø x H) (mm)	148 mm x 115 mm
Weight (kg)	2.95 kg
Color (RAL)	RAL 9003 Signal white
Mounting type	Surface-mounted

Environmental

Operating temperature (℃)	-40 ℃ – 60 ℃ PoE; -50 ℃ — 60 ℃ 12 VDC/24VAC; Up to 74 ℃ according to NEMA TS 2-2003 (R2008), para 2.1.5.1 using fig. 2.1 test profile
Storage temperature (℃)	-40 ℃ – 70 ℃
Cold start temperature (℃)	-40 ℃
Operating relative humidity, non-condensing (%)	5% – 93%
Operating relative humidity, condensing (%)	5% – 100%
Storage relative humidity (%)	0% – 98%
Impact protection	IK10
IP rating	IP66; IP67; IP6K9K
Degree of protection	NEMA type 4X

Ordering information

FCS-8000-VFD-I AI-VFD Bullet 4MP 4.4-10mm IP67
Very fast and reliable identification of smoke and
flames by video-based fire detection.
Bullet,4MP,4.4-10mm
Order number **FCS-8000-VFD-I**

Accessories

NDA-U-PMAL Pole mount adapter large
Universal pole mount adapter, white; large
Order number **NDA-U-PMAL**

MSD-064G IP SECURITY MICROSD CARD 64GB
64 GB industrial microSD card with health status
monitoring
Order number **MSD-064G**

MSD-128G IP SECURITY MICROSD CARD 128GB
128 GB industrial microSD card with health status
monitoring
Order number **MSD-128G**

MSD-256G IP SECURITY MICROSD CARD 256GB
256 GB industrial microSD card with health status
monitoring
Order number **MSD-256G**

NCA-U-PIG Push-in grommet IP66 patch comp. 25pcs
Push-in grommet IP66 patch comp. 25pcs
Order number **NCA-U-PIG**

NCA-U-PIGS Push-in grommet IP67 4.5-7.5mm 25pcs
Push-in grommet IP67, 4.5-7.5mm, 25pcs
Order number **NCA-U-PIGS**

NCA-U-PIGL Push-in grommet IP67 7.5-10mm 25pcs
Push-in grommet IP67, 7.5-10m, 25pcs
Order number **NCA-U-PIGL**

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