HF+PIR Motion Detection

HYTRONIK ®
SENSORS & LIGHTING CONTROL

Koolmesh ®
— TAILOR MAKE YOUR SOLUTION

Bluetooth® ®

DUALsense™

2026

Website: www.hytronik.com

Reliable Detection in Challenging Spaces

Double technology in a single sensor, zero detection errors.

■ Challenge

HF and PIR detection technologies perform well in the right environment. However, in complex or frequently changing spaces, they can fall short resulting in lights switching on unnecessarily or certain areas being left undetected. The consequences are higher energy costs, user complaints, and avoidable reconfiguration work.

■ Solution

Hytronik Dual-Sense™ sensors overcome these challenges by combining the pinpoint accuracy of PIR with the high sensitivity of microwave (HF) detection. By leveraging the strengths of both technologies, Dual-Sense™ delivers reliable, adaptable motion detection across a wide range of applications— ensuring smarter lighting control, improved user comfort, and greater energy efficiency in complex application.

PIR and HF :
powerful technologies, each with its place

Microwave (HF) Detection:

- Emit high-frequency radio waves and detect changes in the reflected frequency, allowing detection of movements over a broader range and through certain materials.

Key Benefits:

- Detects even the smallest or micro-movements
- Can be fully enclosed within light fixtures
- Delivers broad coverage without direct line-of-sight

Common Problems:

- Metal Reflection Interference: Waves bounce off metallic surfaces, creating false triggers.
- Environmental Motion Sensitivity: Moving fans or curtains can be misinterpreted as human movement.
- Signal Penetration Across Zones: Detects people in adjacent rooms or corridors through walls.

Passive Infrared (PIR) Detection:

- Detect heat emitted by moving bodies using a pyroelectric sensor that captures changes in infrared radiation.

Key Benefits:

- Accurate detection based on body heat
- Immune to interference from fans, air conditioning, or airflow
- Ideal for personal or clearly defined detection zones

Common Problems:

- Sunlight & Heat Interference: Strong sunlight or nearby heat sources can cause false triggers.
- Obstruction Blind Spots: Objects like furniture or glass can block detection zones, leading to missed motion.
- Low-Temperature & Slow-Movement Misses:Cold environments or very slow movement may go undetected.

No single method fits all.

That's where DUAL sense™ comes in — intelligently combining both.

Hytronik's Dual-Sense™ blends Microwave and PIR sensing into one cohesive solution. You can even choose which one (or both) to use — either manually or automatically.

4 Detection Modes for Any Scenari :

Tailor the detection behavior to your space's needs — here's how each mode performs.

HF Only
Super-sensitive mode for maximum responsiveness.
Detects even micro-movements across large areas.

PIR Only
High-precision and privacy-focused.
Responds only to body heat within defined zones.

Either HF or PIR
Triggered by either HF or PIR for maximum coverage and responsiveness.
Best for higher sensitivity /quick response.

Both HF and PIR
Activates only when both HF and PIR detect motion.
Ensuring highest accuracy and avoiding false triggers.

Easy Setup Methods :

Once you've chosen your detection mode, configure it instantly with three simple adjustment methods — keeping learning curves low and flexibility high.

DIP Switch
On-device hardware setting for quick and reliable adjustments.

Remote Controller
Make changes from the ground without accessing the fixture.

Koolmesh App
Featured wireless control and advanced configuration via your smartphone/pad.

From simple to complex spaces— Dual-Sense™ always detects right
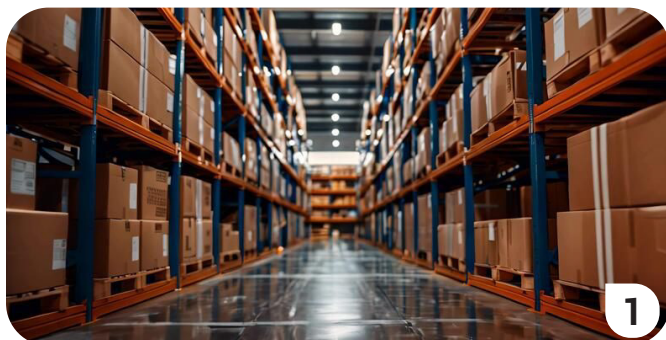
Areas with glass partitions, shelving, or other obstructions

Accuracy Through Transparency - Glass walls block PIR, but HF sees through — Dual-Sense™ uses both for flawless detection.

Industrial spaces

where HF overreacts

Taming the Over-Sensitive - HF alone can overreact to machinery — Dual-Sense™ filters false triggers for reliable control.

Spaces with mixed

or changing uses

Balancing Energy & Comfort - From intense motion to near-stillness — Dual-Sense™ adapts in real time for the right response.

Retrofit projects

with limited wiring options

Smart Upgrades, No Rewiring – Designed for retrofit applications, Dual-Sense™ integrates easily into existing lighting systems, delivering advanced sensing performance without additional cabling or major modifications.

Products Featuring Dual-Sense Technology

Hytronik offers a comprehensive occupancy sensor range designed to match diverse project requirements:

■ Ceiling Mount / Conduit mount / Clamp mount

3 installation methods: suitable for complex mounting scenarios

HIM98 & HIM84
Series

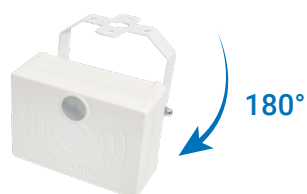## ■ Batten-fit / Bolt-on Mount

Designed for mounting onto a batten style luminance

HIM049/BT

■ Surface Mount

Perfect for large storage room with high ceiling

HIM450VDS/BT

180°

Product Overview

Dual Sense(HF+PIR)

Products	Input Voltage	Output		Detection method	Install Heigh	Daylight Sensor Dimming Function	IP Rate	Active Lux Switching	Page
HIM98 Series	220-240 VAC	0/1-10V 800VA(capacitive) 1000W(resistive)		Dual Sense (HF+PIR)	High-bay max. 15m	Photocell Tri-level Control Daylight Harvest Circadian Rhythm	IP65	√	7 P
HIM84 Series	220-240 VAC	DALI I guaranteed:64 mA I max.: 80mA U rated:16VDC		Dual Sense (HF+PIR)	High-bay max. 15m	Photocell Tri-level Control Daylight Harvest Circadian Rhythm	IP65	√	7 P
HIM98/UH Series	220-240 VAC	0/1-10V 800VA(capacitive) 1000W(resistive)		Dual Sense (HF+PIR)	Ultra High-bay max. 21m	Photocell Tri-level Control Daylight Harvest Circadian Rhythm	IP65	√	9 P
HIM84/UH Series	220-240 VAC	DALI I guaranteed:64 mA I max.: 80mA U rated:16VDC		Dual Sense (HF+PIR)	Ultra High-bay max. 21m	Photocell Tri-level Control Daylight Harvest Circadian Rhythm	IP65	√	9 P
HIM049D/BT	220-240 VAC	DALI I guaranteed:64 mA I max.: 80mA U rated:16VDC		Dual Sense (HF+PIR)	Ultra High-bay max. 21m	Photocell Tri-level Control Daylight Harvest Circadian Rhythm	IP65	√	11 P
HIM450VDS/BT	220-240 VAC	DALI	40mA DALI broadcast output	Dual Sense (HF+PIR)	Ultra High-bay max. 21m	Photocell Tri-level Control Daylight Harvest Circadian Rhythm	IP65	√	12 P
		Volt-free	≤ 48VDC(≤2A)						
			≤ 240VAC(≤4A)						
		0/1-10V & On/Off	Sink: ≤ 100mA						
			Source: ≤ 2mA						

*Please always check the latest datasheet for technical requirements--------http://hytronik.com

Ceiling Mount / Conduit Mount / Clamp Mount

| 0/1-10V | DALI/DALI-2 | High-bay |

HIM98 Series   HIM84 Series

DUAL sense ™   **IP65**

0/1-10V Version
**HIM98 Series**

DALI Version
HIM84 Series

Key Benefits

• Dual sensing (HF + PIR) for ultra-sensitive motion detection

• Integrated daylight and occupancy sensing

• Smart DALI upgrade with no extra wiring (DALI version)

• D4i-compatible: energy, fault, and diagnostics data access (DALI version)

• 10% safety lighting when unoccupied (0/1−10V version)

• 3 lens options for flexible detection coverage

• 3 mounting options with IP65 protection

• 4 combinable detection modes via Koolmesh App

• Designed for high-rack environments such as warehouses, factories, and storage facilities

Detection Range

(Max.)

H:15m

Height
15m

Range Ø
24m
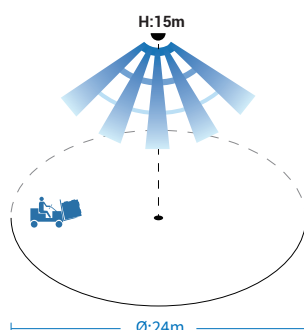
Ø:24m

Main Functions

0/1-10V (HIM98)	DALI Output	Daylight harvest	Tri-level control	Circadian rhythm (HCL)	4 work modess (HF、PIR、HF/PIR、HE&PIR)	3 installation methods
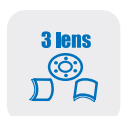
3 lens options	DT6 / DT8 Lighting Control	D4i Driver Compatibility

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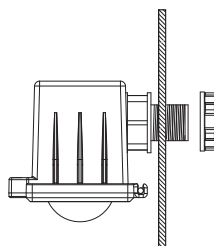
Mechanical Structure (unit: mm)

3 Installation Type Options
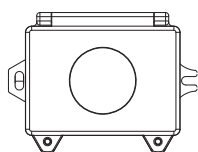
A. Surface Mounting
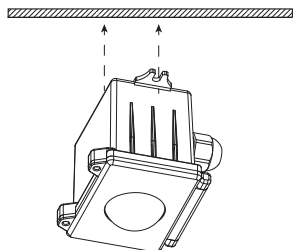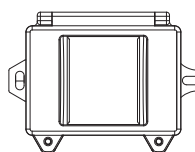
B. Conduit Screw

C. Clamp Mounting
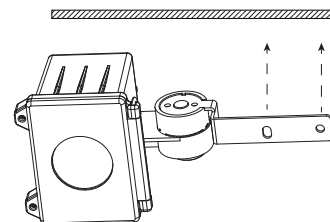
3 Lens Options

L1: Circular detection

L2: Vertical aisle detection

L3: Horizontal aisle detection
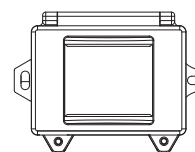
Technical Specifications

Designation	Output	Operating voltage	Stand-by power	Warming-up	Max Withstandable In-rush Current	IP rating
HIM98 Series	0/1-10V 800VA (Capacitive) 1000W (Resistive)	220~240VAC 50/60Hz	<1.5W	20s	120A@160µs	IP65
HIM84 Series	DALI/DALI-2 I guaranteed : 64mA I max : 80mA U rated : 16VDC	220~240VAC 50/60Hz	<1.5W	20s	/	IP65

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Ceiling Mount / Conduit Mount / Clamp Mount

| 0/1-10V | DALI/DALI-2 | Ultra High-bay |

HIM98/UH Series   HIM84/UH Series

DUAL sense ™   **IP65**

Key Benefits

- Extended detection range for wide areas and high-rack spaces
- Dual HF + PIR sensing for reliable motion and daylight Detection
- Smart DALI upgrade with no extra wiring (DALI version)
- D4i-compatible: energy, fault, and diagnostics data access (DALI version)
- 10% safety lighting when unoccupied (0/1–10V version)
- 3 lens options for flexible detection coverage
- 3 mounting options with IP65 protection
- 4 combinable detection modes via Koolmesh App

0/1-10V Version
HIM98/UH Series

DALI Version
HIM84/UH Series

Detection Range

(Max.)

Height
21m

Range Ø
26m

H:21m

Ø:26m
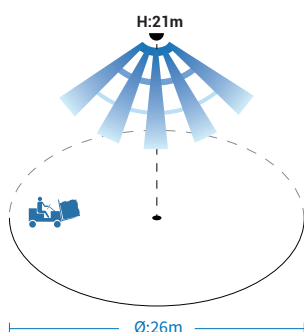
Accessory

For the application of limited coverage areas
[HASUH]

Main Functions

0/1-10V dimming	DALI	Daylight	100% Dim Off	Circadian	HF PIR	3 Meth
0/1-10V (HIM98)	DALI Output	Daylight harvest	Tri-level control	Circadian rhythm (HCL)	4 work modess (HF、PIR、HF/PIR、HE&PIR)	3 installation methods

DT6/DT8	D4i
DT6 / DT8 Lighting Control	D4i Driver Compatibility

*Please always check the latest datasheet for technical requirements--------http://hytronik.com

Mechanical Structure (unit: mm)

3 Installation Type Options

A. Surface Mounting
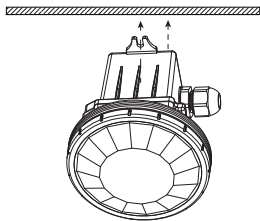
B. Conduit Screw

C. Clamp Mounting

Technical Specifications
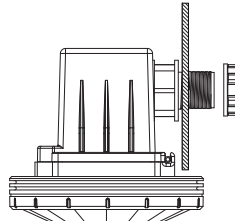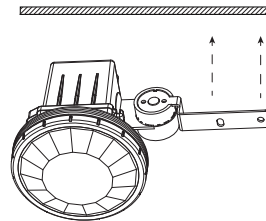
Designation	Output	Operating voltage	Stand-by power	Warming-up	Max Withstandable In-rush Current	IP rating
HIM98/UH Series	0/1-10V 800VA (Capacitive) 1000W (Resistive)	220~240VAC 50/60Hz	<1.5W	20s	120A@160μs	IP65
HIM84/UH Series	DALI/DALI-2 I guaranteed : 64mA I max : 80mA U rated : 16VDC	220~240VAC 50/60Hz	<1.5W	20s	/	IP65

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Batten-fit/Bolt-on Mount

| DALI/DALI-2 | | Ultra High-bay |

DUAL sense ™ **⑧ IP65**

HIM049D/BT

Key Benefits

· Ultra high-bay and wide detection range, suitable for large
 storage room applications
· Ideal for integration with high-bay tri-proof luminaires
· Dual HF + PIR sensing for reliable motion and daylight Detection
· IP65 rating: Suitable for complex applications
· Support D4i driver and collect energy, fault and diagnostics data
· 4 detection methods can be simple configured via Koolmeh App
· Upgrade DALI fixtures with smart lighting without extra wirings

Accessory

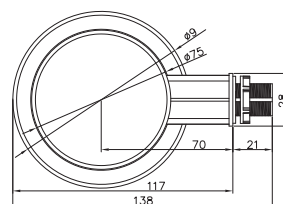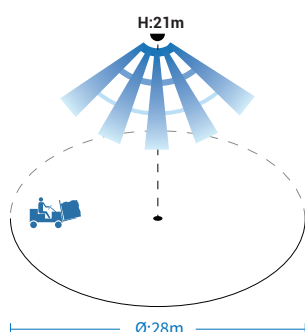For the application of limited coverage areas
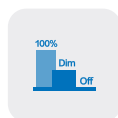[HASUH]

Detection Range

(Max.)

Height
21m

Range Ø
28m

H:21m

Ø:28m

Main Functions

| DALI Output | Daylight harvest | Tri-level control | Circadian rhythm (HCL) | 4 work modess (HF、 PIR、 HF/PIR、 HE&PIR) | DT6 / DT8 Lighting Control | D4i Driver Compatibility |

Technical Specifications

Designation	Output	Operating voltage	Stand-by power	Warming-up	IP rating
HIM049D/BT	DALI/DALI-2 I guaranteed: 64 mA I max.: 80mA U rated: 16VDC	220-240VAC 50/60Hz	<1.5W	20s	IP65

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Surface Mount

On/Off + VFC + 0/1-10V + DALI/DALI-2   High-bay

DUAL sense ™   **IP65**

NEW

HIM450VDS/BT

180°

Key Benefits

• Multiple dimming (output) available, including 2 channel & VFC & On/Off & 0/1-10V & DALI/DALI-2

• Dual sensing (HF + PIR) rapid detection of even the slightest movements

• Omni - direction, adjustable detection angle

• Surface mount available & wall mount

• Ultra-high-bay and wide detection range, suitable for large storage room applications

• IP65 rating for industrial and outdoor installation

• Wireless commissioning via Koolmesh app

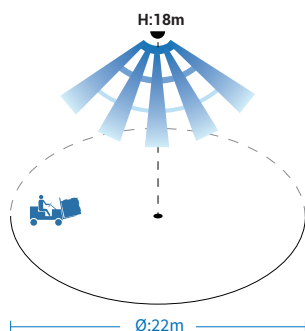• Support D4i driver and collect energy, fault and diagnostics data

Detection Range

(Max.)

Height
18m

Range Ø
22m

H:18m

Ø:22m

Main Functions
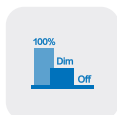
0/1-10V (HIM98)	DALI Output	Daylight harvest	Tri-level control	Circadian rhythm (HCL)	4 work modess (HF、PIR、HF/PIR、HE&PIR)	DT6 / DT8 Lighting Control

D4i Driver Compatibility	On/off control	Volt-free contact

*Please always check the latest datasheet for technical requirements--------http://hytronik.com
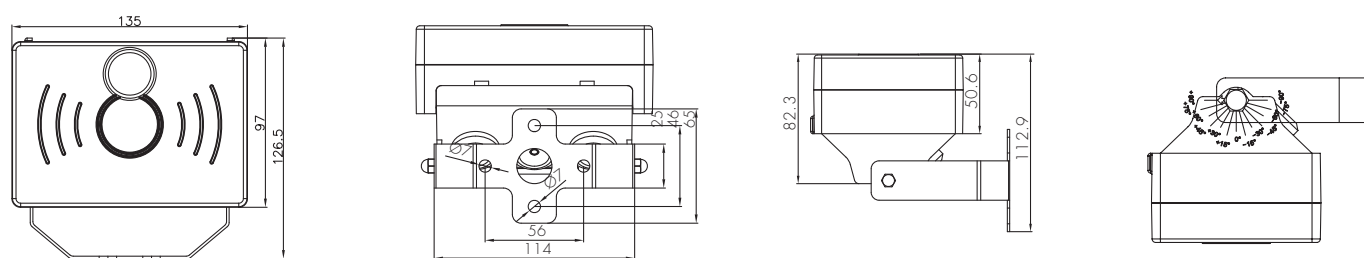
Mechanical Structure (unit: mm)

Technical Specifications

Designation	Output	Operating voltage	Stand-by power	Warming-up	Detection Range Max.	IP rating
HIM450VDS/BT	On/Off: 800VA 1000W 0/1-10V: Sink: ≤100ma Source: ≤2mA VFC: 2A@48VDC; 4A@240VAC DALI Output: I guaranteed: 30mA; I max: 50mA; U rated: 15VDC	220~240VAC 50/60Hz	<2W	20s	Forklift driving: 27m(H) × 17m(H) × 14m(W) Single person walking: 20m(H) × 12m(H) × 8m(W)	IP65

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Real-World Benefits for
Installers & Facility Managers

Fewer callbacks →
Minimizes false triggers and user complaints

4 selectable modes →
Especially efficient in complex or changing spaces

Flexible configuration →
Fine-tune performance via DIP switches or the Koolmesh app

Reduced rework →
Reliable detection from day one

Multi-installation options →
Adapts easily to different mounting scenarios

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Struggling with false triggers and blind spots? Discover Dual-Sense™.

HYTRONIK®
SENSORS & LIGHTING CONTROL

Koolmesh®
— TAILOR MAKE YOUR SOLUTION

Learn how the technology works:

https://hytronik.com/solutions/lighting-control-features/dual-sense-HF-PIR

Contact us:

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