Warehouses & high bay

Aisle-by-aisle occupancy control for storage, manufacturing and gyms

Design guide

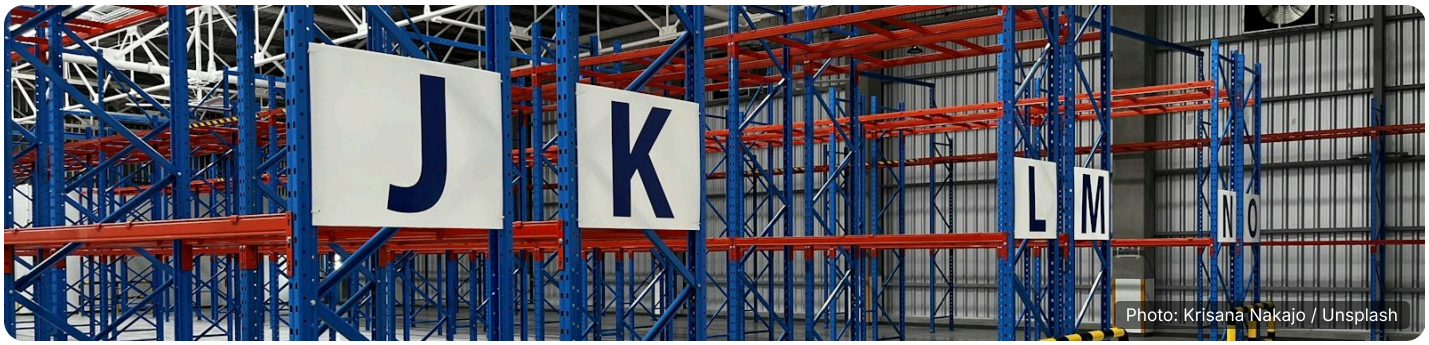


Photo: Krisana Nakajo / Unsplash

Most warehouse aisles sit empty most of the day, which makes them the biggest energy win in the building. Every solution below controls each aisle on its own: the lights sit low or off until a lift turns in, come up to full, and drop back when the aisle empties.

46 ft
max. mounting (ISI-HBWD)

≤ 50%
unoccupied aisle level

3
solutions in this guide

Design goals

- Each aisle controlled independently of other aisles and open areas
- Reduce to 50% or less (or off) within 20 minutes
- Detection at aisle ends so lights are up before the lift arrives
- Sensors matched to mounting heights from about 15 ft to 46 ft

Solutions in this guide

A High bay sensors over each aisle
Wired 0-10V · up to 46 ft

B Battery-free high bay sensors
Wireless · no control wiring

C Sensor in every fixture
Fixture-integrated · private label

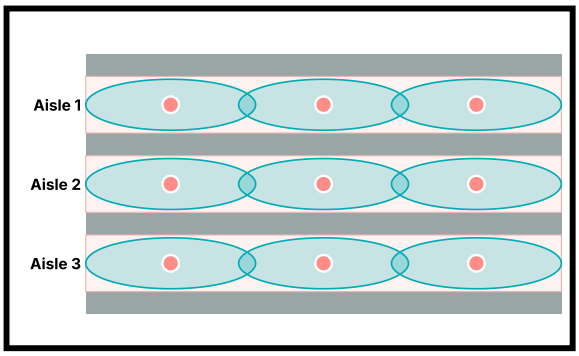
Code checklist

Requirement	Typical code target	How the solutions meet it
Aisle control	Each aisle controlled independently of other aisles and open areas	One sensor group per aisle
Partial-off	Reduce lighting by at least 50% within 20 min of the aisle emptying	0-10V dimming to the unoccupied level; time-out 20 min or less
Automatic shutoff	Building-wide off when unoccupied (schedule or sensor)	Sensors dim or turn off each aisle; add a schedule for after hours
Open areas	Separate control from aisles	Separate sensors over staging and dock areas

Typical requirements of ASHRAE 90.1-2019 and the 2021 IECC. Local amendments and other code editions differ; the adopted code for the project governs.

A Solution A: High bay sensors over each aisle

Wired 0-10V · up to 46 ft



High bay sensor and aisle pattern · Racking · Aisle (own control group)

DANLERS ISI-HBWD wide-detection sensors mount over the aisle centerline and dim that aisle's fixtures over 0-10V. Racking blocks the view, so each sensor sees only its own aisle.

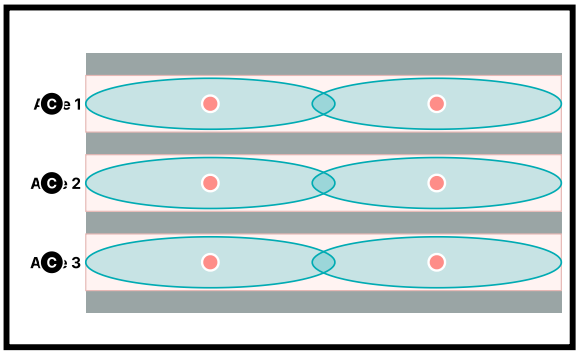
- Mount over the aisle centerline, about every 30 ft
- Put the first and last sensor near the aisle ends
- Wire each aisle's sensors in parallel to that aisle's drivers

Qty	Model	Description
9	**ISI-HBWD10V12V**	High bay sensor, 0-10V, three per aisle
—	**12 V DC Class 2 supply**	Sensor power per wiring guide
—	**0-10V control wiring**	One group per aisle

Tech sheet: ES-TS-104

B Solution B: Battery-free high bay sensors

Wireless · no control wiring



High bay sensor and aisle pattern · Aisle controller · Racking · Aisle (own control group)

ILLUMRA E9T-OSH self-powered high bay sensors link to an E9X-DUV-10VTP dimming controller for each aisle's circuit, so no low-voltage wiring runs across the racks.

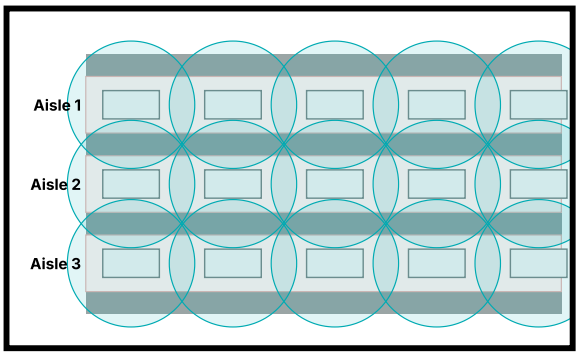
- Mount E9T-OSH at 15–40 ft (60 ft Ø at 33 ft)
- Link each aisle's sensors to that aisle's controller only
- Controllers act as repeaters for long buildings

Qty	Model	Description
6	**E9T-OSH**	Self-powered high bay occupancy sensor, two per aisle
3	**E9X-DUV-10VTP**	20 A 0-10V dimming controller, one per aisle

Tech sheet: ES-TS-105 / 107

C Solution C: Sensor in every fixture

Fixture-integrated · private label



Fixture with sensor module
Racking
Aisle (own control group)

An ISI MOD17M module in each high bay fixture controls that fixture, so the lit area follows the lift down the aisle. See ES-DG-06 for fixture-integrated design.

- One module per fixture; long-range optic for high mounting
- Modules with the same output can be wired in parallel
- Specify modules with the fixture order for factory install

Qty	Model	Description
15	**ISI-MOD17M10V12V**	Luminaire sensor module, one per fixture
15	**12 V DC supply**	ISI-PSU12VDC or driver auxiliary supply

Tech sheet: ES-TS-104

Design tips

- PIR needs about 7 °F between people and the background; avoid aiming across heaters and fans.
- Spacing shown is illustrative; confirm with the coverage chart for the actual mounting height.
- Set the unoccupied level high enough for safe egress if lights never fully turn off.

Related tech sheets

ES-TS-104 ISI smart sensors · **ES-TS-105** Self-powered wireless sensors · **ES-TS-107** Wireless load controllers

Starting points only: check every project against its adopted energy code, the reflected ceiling plan and current manufacturer data. Diagrams are illustrative. Send plans to info@energiocontrols.com for a project layout. Products by B.E.G., DANLERS and ILLUMRA. Photo: Unsplash License.