Scope: Interior spaces, exterior building features and building grounds. Interior lighting alterations where 20% or more of the connected lighting is altered.

### Automatic off controls

**9.4.1.1(h) Automatic full off**
- Auto off within 20 min
- Control area can be no more than 5,000ft²

**Primary exceptions:**
- Shop and classroom laboratories
- Where auto off would endanger safety or security
- Lighting for 24 / 7 operations

**Required in:**
- Classrooms
- Lecture
- Training rooms
- Conference
- Copy / Print rooms
- Meeting
- Multipurpose rooms
- Lounge
- Break rooms
- Private offices
- Restrooms
- Storage rooms
- Sanitorial closets
- Locker rooms
- Office <= 250ft²
- Storage rooms >=50 to <= 1,000ft²

**Primary exceptions:**
- Shop and classroom laboratories
- Where auto off would endanger safety or security
- Lighting for 24 / 7 operations

**Automatic partial off**
- Automatically reduce general lighting <=50% within 20min of occupants leaving.
- Automatic full off complies

**Primary exceptions:**
- Lighting for patient care
- Where auto off would endanger safety or security
- Lighting for 24 / 7 operation

**Required in:**
- Classrooms
- Lecture
- Training rooms
- Conference
- Copy / Print rooms
- Meeting
- Multipurpose rooms
- Lounge
- Break rooms
- Private offices
- Restrooms
- Storage rooms
- Sanitorial closets
- Locker rooms
- Office <= 250ft²
- Storage rooms >=50 to <= 1,000ft²

**Primary exceptions:**
- Shop and classroom laboratories
- Where auto off would endanger safety or security
- Lighting for 24 / 7 operations

**9.4.1.1(i) Scheduled shut off**
- Lighting not already shut off by automatic full off control must be shut off when scheduled unoccupied:
  - Time schedule or other control device signal
  - Control area <= 25,000ft² but not more than one floor
  - Override <= 2 hrs and area <= 5,000ft²

**Primary exceptions:**
- Lighting for patient care
- Where auto off would endanger safety or security
- Lighting for 24 / 7 operation

**Required in:**
- Corridors, Restrooms, Healthcare facility, Storage rooms <50ft², Stairwells, Lobbies, Electrical / mech rooms, Where manual on would endanger safety or security

**Manual controls**

**9.4.1.1(a) Local control device**
- One or more manual control devices in a space:
  - Readily accessible
  - Can see lighting controlled from local device (can be on / off switch or dimmer)

**Primary exceptions:**
- Remote control devices permitted for safety or security, provided it has a status pilot light and is labeled to identify lights controlled

**Is the space <= 10,000ft²:**
- Yes – control area must be <= 2,500ft²
- No – control area must be <= 10,000ft²

### Daylight responsive controls

**9.4.1.1(e) and 9.4.1.1(f) Daylight-responsive controls**
- Either continuous dimming or at least one step between 50-70% and a second step between 20-40% or lowest dimmed level
- Turns off all controlled lighting
- Sidelighting – two independent zones
- Toplighting – single primary zone under skylights and monitors

**Primary exceptions:**
- Adjacent structure obstruction
- Glazing < 20ft²
- Retail spaces
- Toplighting:
  - Obstruction > 1,500 hrs/year
  - Skylight visual transmittance < 0.4
  - Climate zone 8 and lighting < 200W

**Is Primary daylight area lighting >= 150W or Is Primary & Secondary daylight area lighting >= 300W**
- Yes – Daylight control required (choose dimming or step control)
- No – Daylight control NOT required

**Choose one:**
- Bi-level switching
- Continuous dimming

### Specific application controls

**9.4.1.3 Specific application controls**
- Lighting that must be separately controlled from the space’s general lighting

**Primary exceptions:**
- None

**Required in:**
- Display and accent
- Lighting in display cases
- Supplemental task lighting
- Under cabinet / shelf lighting
- Lighting equipment for sales
- Lighting education or demonstration
- Plant growth
- Food warming

**8.4.2 Automatic receptacle control**
- At least 50% of receptacles and 25% of feeders to modular furniture shall auto off by either:
  - Time schedule - <= 2hr override, control area <= 5,000ft²
  - Occ sensor with 20 min off delay
  - Automated signal that shall auto off receptacles within 20 min

**Primary exceptions:**
- Equipment operating 24 / 7
- Where auto control would endanger safety or security

**Required in:**
- Private offices
- Print / copy rooms
- Individual workstations
- Conference rooms
- Break rooms
- Classrooms
### Exterior lighting controls

#### 9.4.1.4 Exterior lighting controls
- Exterior lighting automatically turn off when daylight is present.
- Façade or landscape lighting shall have automatic off no later than midnight or business closing and 6AM or business opening.
- All other lighting must be automatically reduced by >30% by
  - No later than midnight to 6AM
  - 1hr after business close to 1hr before open
  - When unoccupied for 15 minutes.

**Primary exceptions:**
- Lighting for covered vehicle entrances / exits and parking structures
- Lighting integral to signage

**Required in:**
- Parking lot
- Area lighting
- Site lighting

#### 9.4.1.2 Parking garage lighting control
- Automatic lighting shut off per 9.4.1.1(i)
- Automatic reduce lighting >= 30%
- No activity for 20min
- Area controlled <= 3,600ft²
- Covered vehicle entrances and exits have separate controls to reduce lighting <=50% from sunset to sunrise
- Within 20ft of perimeter wall openings, automatically reduce lighting power in response to daylight.

### Functional testing

#### 9.4.3 Functional testing
- Lighting controls tested for proper calibration, adjustment, programming, and working condition
- Test requirements:
  - Occupant sensor controls (9.4.3(a))
  - Time-switch controls (9.4.3(b))
  - Daylight responsive controls (9.4.3(c))

- Testing individual shall not be involved with project design or construction and must provide certifying documentation showing lighting control performance criteria

### How Eaton control systems help meet ASHRAE 90.1 - 2016:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>DLVP</th>
<th>Room Controller</th>
<th>WaveLinx</th>
<th>iLumin Plus</th>
<th>Fifth Light</th>
<th>LumaWatt Pro</th>
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