For years, designers have been searching for an ADA compliant handrail that delivers ANSI compliant illuminance levels.

LED HANDRAIL

luxrail™
luxrail™ is an LED-based illuminated handrail. This energy efficient, sustainable solution finally addresses the building industry’s need for an **ADA compliant** handrail that produces **ANSI required** illumination levels for both interior and exterior stairs, ramps and pedestrian walkways.
Application
ANSI and ADA compliant, luxrail is an indoor/outdoor LED-based handrail that delivers functional illumination. Two intensities may be specified: standard output and high output. The standard light output version delivers illumination levels appropriate for exterior applications (2 footcandles at grate) as well as for dark interior environments with low ambient illumination levels (e.g., themed environments, theaters and residential areas). The high output version delivers illumination levels applicable to interior environments – providing in excess of 10 footcandles along the path of egress (ANSI) required for stair trades. Independent photometric test reports and IES Format data are available at www.iolighting.com.

luxrail’s standard handrail gripping surfaces are circular in cross section and meet 2004 IBC requirements. Chromium or other anodizing coatings are used for durability. The two 45˚ beam patterns are most suitable for illuminating pathways, while the 10˚ beam spread offers accent lighting for optional glass or stainless-steel cable railing infills. Reference page 44 of this catalog for information regarding infill options. To ensure proper performance, architectural details should allow for ventilation and air flow around the fixture. Ambient temperature surrounding the fixture shall not exceed 120˚F (48.9˚C). To ensure each LED is provided thermal and electrical management properties that deliver 10 ˚C beam spread offers accent lighting for optional glass or stainless-steel cable railing infills.

Light Output
Two luminous intensities are available for white light. All values below are initial lumens per foot. IES LM-79 format files may be obtained from the factory or downloaded from www.iolighting.com.

Construction
luxrail may be post mounted or wall mounted. Mounting hardware (post or wall) is typically required up to 5’ O.C., depending on the handrail application. Post and wall bracket spacing must be determined by a licensed architect or engineer; le can provide engineering upon request. luxrail is available in stainless steel and aluminum. Grab bars are available in aluminum only. The lighting fixture component of the luxrail is a stand-alone unit and is available in incremental nominal lengths that range from 6” to 60”. Vandal resistant access chamber allows units to be removed for maintenance purposes.

All handrail component parts are engineered for quick installation. Field welding or cutting is typically not required. All parts are prefabricated to field dimensions and are assembled in the field with mechanical connection or epoxy. Contact le for recommended handrail installers.

The light fixture’s housing is made of a light weight, yet durable aluminum, providing the recommended hand rail sink requirements for the LEDs. Housing, patented optical assembly and electrical components are designed to be shock resistant. A power supply is optional and can be added at the factory. Contact le for more information regarding daisy chain limitations, remote distance limitations, power supply representative.

Electrical
luxrail houses a low voltage LED-based light fixture that is integrated into the underside of the handrail. 24 volt 96 watt power supplies are provided as a standard. For detailed information regarding data chain limitations, remote distance limitations, power supply options, and dimming options consult the le website, the le catalog (pages 98-100) or an le representative.

Dimming modules must be specified separately. For detailed information, see page 98 of this brochure or download the power supply specification sheet from www.iolighting.com.

Power Consumption
Standard Output: 1.44 w/ft; High Output: 2.72 w/ft
Power consumption does not include power supply losses.

7. LIGHT COLOR
1. White: 2700K
2. 3K Warm White
3. 5K Cool White
4. 277v w/dim
5. 120v w/dim
6. 22AWG, 300v power cord
7. 5KHO Warm White (3)
8. 27K Warm White
9. 3000K White
10. 4000K Cool White
11. 5000K Cool White
12. PM Post mounted
13. NR Not required
14. GB4 4’ nominal
15. GB3 3’ nominal
16. GB2 2’ nominal
17. PM Post mounted
18. LED Output - 65 Degree Warm White
Wall Mount Handrail Options

STAIRS
Stair handrail wall returns may be specified with a 12” extension. It requires field verified “horizontal” and “diagonal” stair dimensions in order to generate shop drawings. Additional field dimensions may be required depending on the complexity of the handrail design.

POST MOUNT OPTIONS
Posts are chosen to match or complement your handrail selection. Posts are spaced between 4’ and 5’ on-center depending on specified size and alloy. Posts may be surface mounted or embedded below concrete surface and set with quick-setting grout by contractor. Base plates are optional.

STAIRS
Stair handrail wall returns may be specified with a 12” extension. It requires field verified “horizontal” and “diagonal” stair dimensions in order to generate shop drawings. Additional field dimensions may be required depending on the complexity of the handrail design.

RAMPS
Ramp handrail wall returns may be specified with a 12” extension. It requires field verified “horizontal” and “diagonal” ramp dimensions in order to generate shop drawings. Additional field dimensions may be required depending on the complexity of the handrail design.

ADA Compliant Return Options

Return to Walking Surface

Return to Post

Lake Forest High School
Designer: Perkins & Will
Photographer: Dave Pickett

Edison Rex Hotel
Photographer: Dave Pickett
Handrail gripping surfaces with a circular cross section shall have an outside diameter of 11⁄4” (32mm) minimum and 2” (51mm) maximum.

The following references are taken from the 2004 Americans with Disabilities Act Accessibility Guidelines.

505.7.1 CIRCULAR CROSS SECTION
Handrail gripping surfaces with a circular cross section shall have an outside diameter of 11⁄4” (32mm) minimum and 2” (51mm) maximum.

Length Options
Standard grab bar lengths may be ordered available in nominal lengths of 2’, 3’, 4’, and 5’.

Application Options
Grab bar may be customized to accommodate ADA lighting or aesthetic requirements. Submit concept sketches to io Lighting for design assistance.

Custom luxrail grab bar lengths can be specified to accommodate all ADA Compliant applications.

Handrail Dimensions
The following references are taken from the 2004 Americans with Disabilities Act Accessibility Guidelines.

505.7.1 CIRCULAR CROSS SECTION
Handrail gripping surfaces with a circular cross section shall have an outside diameter of 11⁄4” (32mm) minimum and 2” (51mm) maximum.
Electrical

luxrail integrates a low voltage LED-based linear light fixture within the handrail. luxrail requires a power supply to transform and regulate the voltage. This power supply is called a “driver.”

The luxrail requires that the 24v driver be remotely located. The driver must be housed in an enclosure that is rated for use in both interior and exterior applications. luxrail utilizes a compact electronic driver which is protected against open circuit, short circuit, overload and overheating.

The electronic driver which is protected against open circuit, short circuit, overload and overheating utilizes a compact enclosure that is rated for use in both interior and exterior applications.

The luxrail requires that the 24v driver be remotely located. The driver must be housed in an enclosure that is rated for use in both interior and exterior applications.

When a handrail is installed on ramps, stairs or landings 30” above finished floor – it is referred to as a “guardrail.” Handrails provide guidance, continuous runs, suitable for dry, damp and wet locations, built in wiring compartments for easy installation.

Built-in EMI Filter for low noise

Infill Options

When a handrail is installed on ramps, stairs or landings 30” above finished floor – it is referred to as a “guardrail.” Handrails provide guidance, while guardrails prevent accidental falls. Guardrails have opening limitations. The most common requirement is that no opening be large enough to allow an 11” sphere to pass. luxrail has two infill options to address this requirement: stainless steel cable and glass. Stainless steel cable and all required hardware are supplied with system. For glass infill option, panel clips are supplied with system; glass is supplied by others.

Stainless Steel Cable Infill

Stainless steel cable railing system integrates all cable hardware inside the end posts, making it virtually invisible. The cable railing system may only be used with the stainless steel railing frame. Stainless steel railing hardware can be factory wrapped or field swaged by the installer. Cable infill is only available for flat surfaces.

Glass Infill

Panels are used to support 1/2” or 1/4” tempered glass infill panels. Glass is provided by others.

200-Watt Driver

**IO PART#: DR200AM**

**Key Features**

- Recommended for long continuous runs
- Suitable for dry, damp and wet locations
- Built in wiring compartments for easy installation
- Built-in EMI Filter for low noise

**Specifications**

- Location: Wet IP65
- Output Voltage: 24v DC
- Output Power: 200w
- Input Voltage: 90 to 264 VAC
- Frequency: 47 to 63 HZ
- Ambient Temp: -20˚C to +50˚C
- Weight: 6.61 lbs
- Dimming: Yes w/ 250IOXFDIM, Requires one dimming module for each channel.

96-Watt Driver

**WITH DIMMING OPTION**

**IO PART#: DR96MGD**

**Key Features**

- Integrated dimming available
- Suitable for dry, damp and wet locations
- Locations with an adequate end plate and connectors
- Built in wiring compartments for easy installation

**Specifications**

- Location: Wet IP65
- Output Voltage: 24v DC
- Output Power: 96w
- Input Voltage: 100 to 277 VAC
- Frequency: 47 to 63 HZ
- Ambient Temp: -30˚C to +70˚C
- Dimming: Integrated Available

60-Watt Driver

**WITH DIMMING OPTION**

**IO PART#: DR60MGD**

**Key Features**

- Integrated dimming available
- Suitable for dry, damp and wet locations
- Locations with an adequate end plate and connectors
- Built in wiring compartments for easy installation

**Specifications**

- Location: Wet IP65
- Output Voltage: 24v DC
- Output Power: 60w
- Input Voltage: 90 to 264 VAC
- Frequency: 47 to 63 HZ
- Ambient Temp: -30˚C to +70˚C
- Dimming: Integrated Available

20-Watt Driver

**IO PART#: DR200S**

**Key Features**

- Small enclosure size
- Light weight, low profile
- Short circuit and overload protection
- Low power supply losses

**Specifications**

- Location: Dry
- Output Voltage: 24v DC
- Output Power: 20w
- Input Voltage: 120 to 240 VAC
- Frequency: 50 to 60 HZ
- Ambient Temp: -20˚C to +50˚C
- Weight: 21 lbs
- Dimming: Yes w/ 250IOXFDIM

<table>
<thead>
<tr>
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Accessibility Code References

ICC: International Code Council
BOCA: Building Officials Code Administration
ICBO: International Conference of Building Officials
SBCCI: Southern Building Code Congress
IBC: International Building Code
IRC: International Residential Code

Prior to 2000, BOCA, SBCCI and ICBO each prepared their own model codes that were regionally applied. In 1999, these three organizations merged to form the International Code Council (ICC).

In 2000, the ICC published the International Building Code (IBC) and the International Residential Code (IRC). The IRC and the IBC model codes have since been adopted by states throughout the U.S.

Sustainability
io Recommends Aluminum

GREEN
Aluminum is one of the most sustainable materials on earth. Making up 8% of the Earth’s crust, Aluminum is one of the most plentiful elements and most preferred building material because it can be indefinitely recycled without loss of properties or quality.

DURABLE
Aluminum generates a protective oxide coating which makes it naturally corrosion resistant, weather proof and immune to harmful effects of UV rays. Requiring little to no maintenance, Aluminum does not absorb moisture and is saltwater resistant. It will not rust, rot, swell, warp, twist, split or crack.

ROBUST
Aluminum is about one-third the weight of steel yet its tensile strength is perfect for handrails, curtain walls, window frames, wall framing systems and solar shading.

LEED
Although recycled material percentages constantly change, approximately 25% of io’s aluminum handrail comes from recycled pre-consumer aluminum.

FINISH
Aluminum can be anodized or painted in any color. Some surface finishes can offer increased durability and corrosion resistance. Consult io Lighting for details.

ANSI Compliant Illumination Levels

ILLUMINANCE LEVEL REQUIREMENTS
IBC: 1 footcandle for means of egress for emergency lighting.
IRC: Light level not specified.
ANSI A117: Stairways shall have 10 footcandles measured at the center of the tread surface and on landing surfaces within 24” of step nosing.

ACCESSIBILITY GUIDELINES
Two references:
1) ICC/ANSI A117.1: Accessible And Usable Buildings & Facilities
2) The Americans with Disabilities Act Accessibility Guidelines (ADAAG)

Note: ADA is a civil rights law – it is not a building code. However, the ADAAG has been incorporated into many state and local building codes.

Handrails and Guardrails

HANDRAILS PROMOTE GUIDANCE
Handrails are located between 34” and 38” above stair nosings or ramp surfaces and have dimensional limitations for graspability. In areas where children are the principal users (e.g., elementary schools), the ADAAG recommends a second set of handrails be located at 28” above stair nosings or ramp surfaces.
Reference: IBC 2000, ANSI A117.1, ADAAG

GUARDRAILS PREVENT ACCIDENTAL FALLS
Guardrails are generally required for ramps, stairs or landings above 30”. The height will vary depending on local code. The IRC requires a guardrail to be 42” in height. If a 42” guardrail is called for on a stair or ramp, it will require a handrail at a height of between 34” and 38”.

The IRC requires 36” high guardrails for porches, balconies and raised floor surfaces. A guard’s top rail does not have to meet the requirements for graspability if a handrail is in place.
The Specification Process

luxrail crosses into two separate sections of the architectural specification – both as handrail which is listed in the “Miscellaneous Metals” section and as lighting which is listed in the “Electrical” section. As such, it requires two different trades for installations: an experienced handrail installer and a licensed electrician. It is important that contractors understand that luxrail must be bid on and installed by two separate trades to ensure accurate labor estimates. On some projects, architects have created an entirely new and separate section of the specification package for luxrail, spelling out exactly how the bidding and installation need to be handled.

When requesting a quote for luxrail, fully dimensioned plan and elevation drawings of each individual railing section are required. Stair and ramp elevations can be found in the Architectural details. Exterior railing locations and elevations are usually shown in the Landscape plans and details. The elevations illustrate the required style, size and features of each railing. The plan views show the location, length and quantity of rails needed. The lighting fixture schedule should also be provided as it lists the desired light output, color and distribution. From these project specific details a customized quotation is created.

After an order is placed, detailed submittal drawings are prepared and sent to the customer for approval. The submittals must be reviewed for compliance with site conditions, conformance with lighting specification and fulfillment of the electrical power requirements. This may require review by several parties.

The lead-time on luxrail fixtures begins once the signed approval drawings have been returned. Once approved, luxrail is custom fabricated to the exact project details and specifications as illustrated in the approvals.

Submittals should be reviewed with three objectives in mind:

1. The handrail drawings must be reviewed for compliance to site conditions. Finished stair and ramp dimensions usually vary from the architectural plans. For this reason, actual field dimensions must be used when reviewing the submittals. This portion of the review is typically done by the handrail installer. Contact io Lighting for approved luxrail installers.

2. The LED fixture counts and run lengths must be reviewed to verify that adequate power is provided to each railing and that all remote driver restrictions have been met. This portion of the review is typically done by the electrical contractor.

3. The luxrail catalog code must be reviewed for compliance to the lighting specifications. The light output, beam spread and distribution should be verified. This portion of the review is typically done by the lighting designer.

io has a dedicated team for luxrail projects. Let us help you from design through installation.