

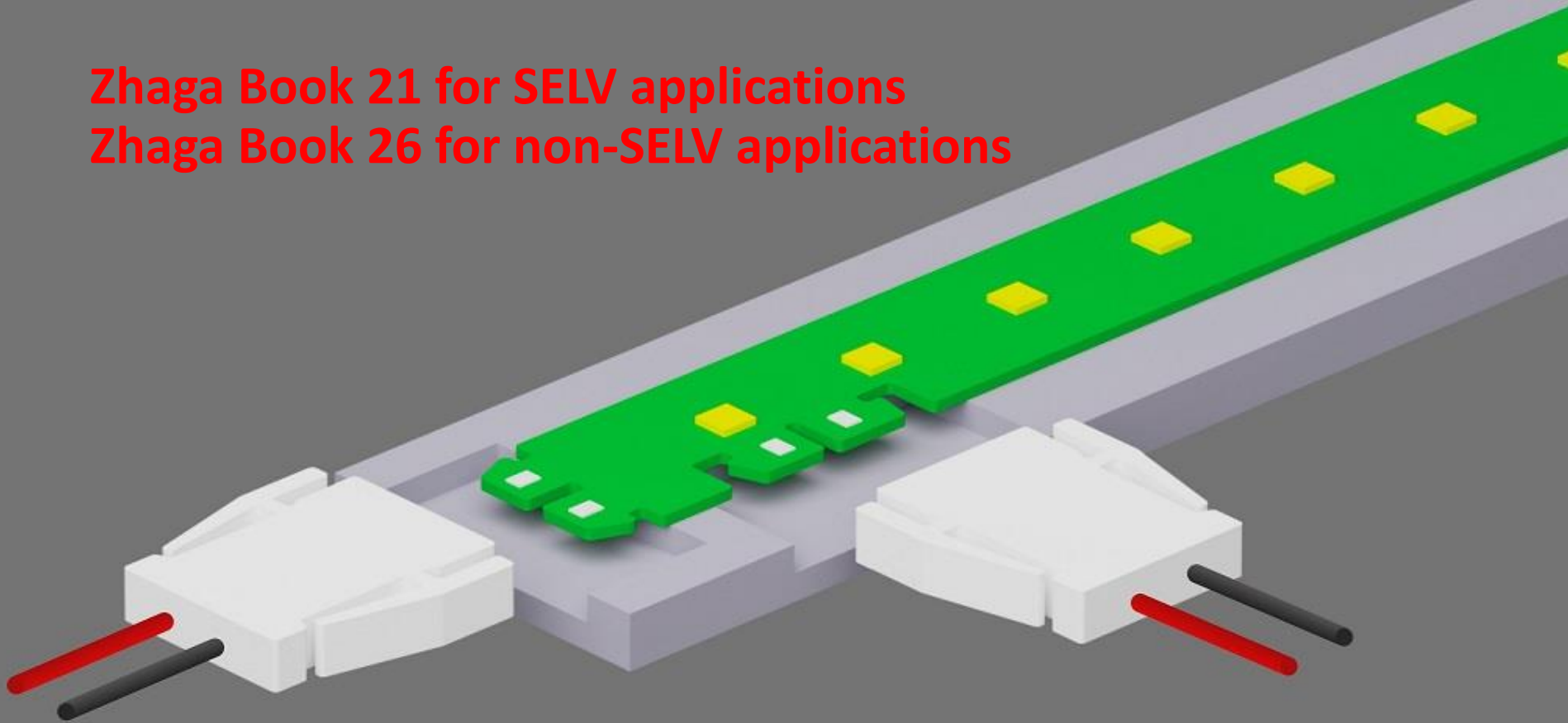
Zhaga Books 21 and 26

Linear socketable LED modules for SELV and non-SELV applications

March 2025



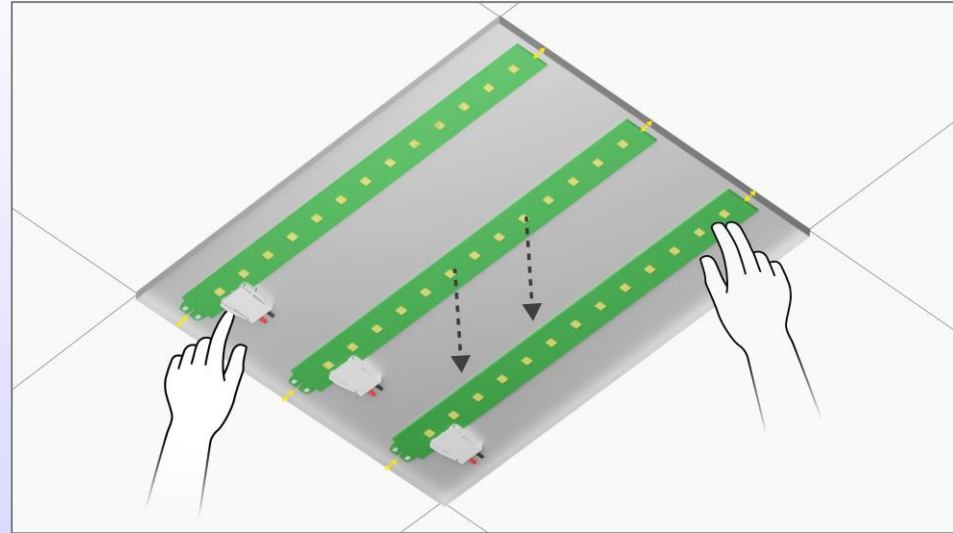
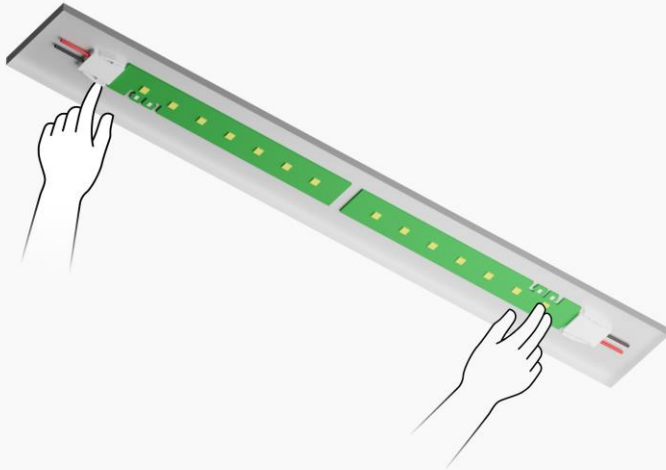
Zhaga Book 21 for SELV applications
Zhaga Book 26 for non-SELV applications



What do Zhaga Books 21 and 26 specify?

- Fully interoperable LED modules with standardized interfaces that define the operating conditions and options for electrical connection and mechanical fixation.
- Different LED module lengths (1 to 5 ft) with recommended lumen packages, thereby allowing choices in portfolio and flexibility in design.
- LED board areas for mechanical mounting of long LED module(s) in luminaires with, for example, clamps.
- Two alternative contact areas:
 - One at the long side of the LED module, enabling seamless lighting applications or troffers.
 - One at the short side of the LED module, enabling extremely slim linear luminaires for track lighting systems.
- LED modules may be installed by electricians, facility managers or other qualified persons.
- Zhaga Book 21 addresses SELV (< 60V) and Book 26 non-SELV (< 270V) applications.

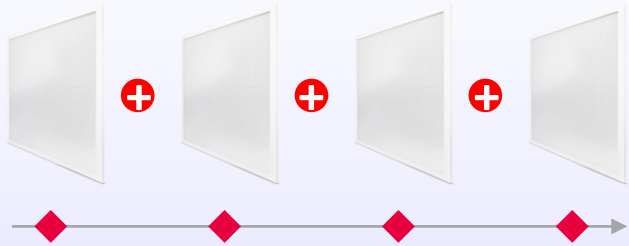
Zhaga Books 21 and 26 - applications



Why use Zhaga Books 21 and 26 LED modules?

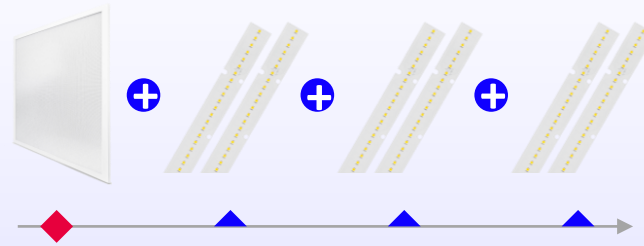
- The standardized system secures a future-proof and reliable way to replace linear modules and to preserve the luminaire value.
- The standardized interfaces enable a plug-and-play and cost-effective solution for luminaire assembly, maintenance and upgrade of luminaires by OEM and maintenance personnel.
- The defined electro-mechanical interface provides full flexibility in the selection of connector and LED module products.
- The Zhaga Books 21 and 26 contribute to the essential mission of Zhaga, taking a leading role in the transformation of the lighting industry towards increased sustainability and service-based business models.

Replaceable LED Modules extend luminaire lifetime



Current LED Luminaire

- Sealed-for-life
- High environmental impact



Sustainable LED Luminaire

- Serviceable
- Multi-vendor spare parts based on standardized interfaces
- Low environmental impact due to reduced waste

Zhaga Books 21 and 26 retain luminaire and LED module design freedom

- Electro-mechanical interface
 - Different connector designs are possible while the specified contact areas ensure interoperability.
- Mechanical fixation
 - Means for module fixation can be freely designed within specified mounting areas on the module
- Operation
 - Operational conditions can be freely chosen according to the module specifications

Zhaga Books 21 and 26 enable field interoperability



- Electro-mechanical interface
 - Poka-yoke feature between module and connector/luminaire
 - Module contact areas (contact pads positions and size)
- Mechanical interface
 - Module dimensions (length, width, height)
 - Dedicated mounting areas to fix the module in the luminaire
- Electrical interface
 - Boundaries for operating currents and voltages of modules ensure full interoperability
 - Operating current can be set by the luminaire maker within specified limits
- Thermal interface
 - Test luminaires and test modules are specified to check thermal characteristics of modules and luminaires, thereby ensuring interoperability
- Photometrical interface
 - Flux values referenced to rated operating current are only recommended to allow for design freedom
 - LED modules must provide luminous flux as declared

How do Zhaga Books 21 and 26 differ?

Zhaga Book 21

- Modules are electrically connected in parallel
- All modules have voltage below 60 V
- LED modules have rated operating current (175 – 1750 mA) depending on their length

Zhaga Book 26

- Modules are electrically connected in series
- LED modules have rated operating voltage (20 – 270 V) depending on their length
- All modules have rated operating current of 250 mA

Zhaga Books 21 and 26 certification logos

On luminaires and modules:



- Placement of certification logos on certified luminaires and LED modules indicates:
 - Luminaire is approved for Book 21 / 26 LED modules
 - LED module can be used in Book 21 / 26 luminaires
 - LED module is plug & play exchangeable facilitating easy serviceable luminaires
- Users can identify suitable LED modules and luminaires by the Zhaga Books 21 or 26 certification logo

On connectors:

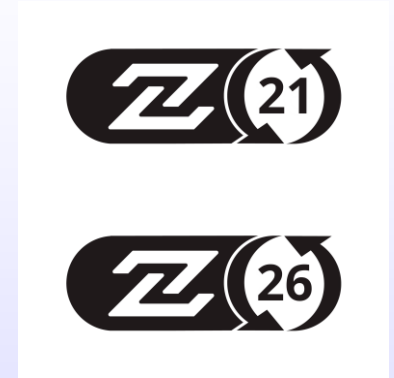


- Placement of certification logo on certified connectors indicates:
 - Connector is approved for Book 21 and 26 applications
- Users can identify suitable connectors by the Zhaga certification logo

The certification logos indicate that the certified products are interoperable and thereby enable easy luminaire serviceability and support circular economy.

Zhaga certification of luminaires and modules

- Certification gives confidence in interoperability
 - Certification is carried out by an independent test center
 - Certified products are listed in the Zhaga public database
 - Certification logos are trademarked to prevent misuse
 - Certification ensures that luminaires can host also next-generation Book 21 and 26 modules
- Certification gives business advantages
 - Interoperable certified components can be provided by multiple suppliers
 - Certification logos provide an established brand for product marketing



Zhaga Books 21 and 26 – Linear socketable LED-modules

Open standard

**Future-proofing
luminaire design**

**Supporting
Circular Economy**

**Toolless
Plug & Play**



Cost-effective

**Zhaga certified
interoperability**