

### **MICROTOOLS**

Modular LED lighting system

Impressive presentation in minimum spaces









#### The art of miniaturisation

The smallest details, perfectly emphasised

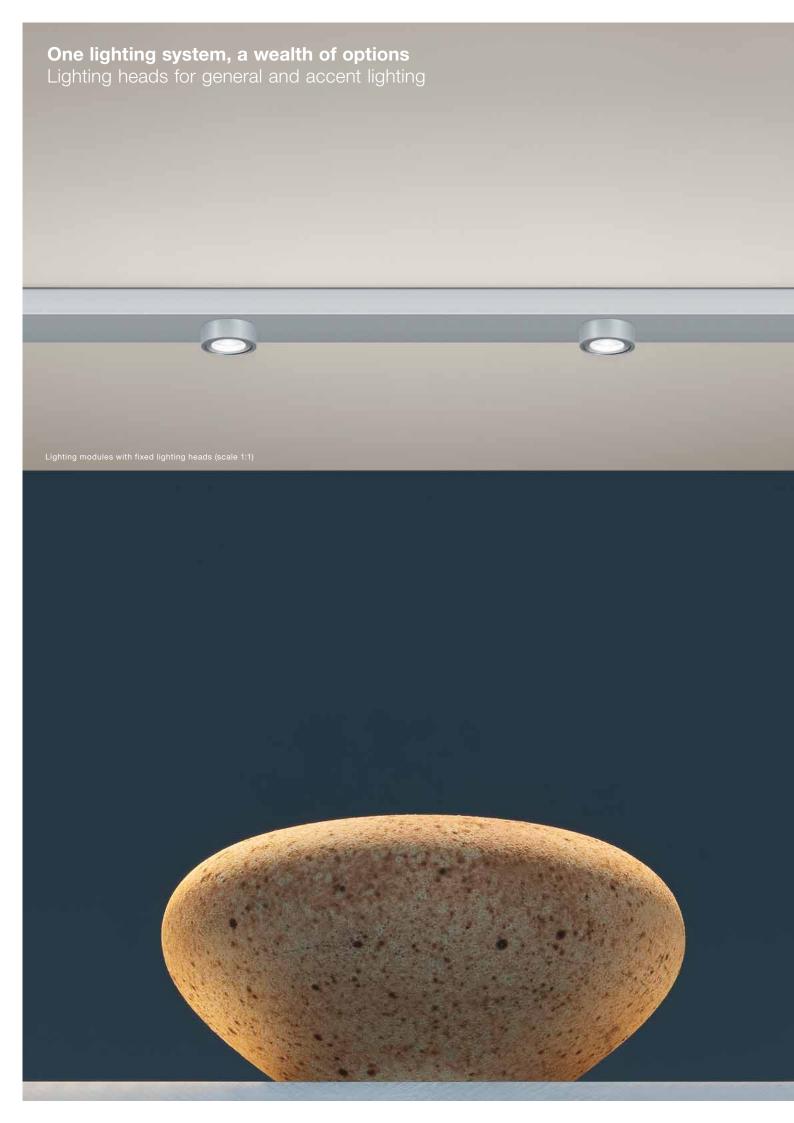
MICROTOOLS is a flexible lighting tool for skilfully presenting objects and goods and for heightening their sense of value, especially in shelves, showcases and recesses with wood, glass and metal bases. The modular LED lighting system steps into the background and its reduced design facilitates its almost invisible integration. The special photometric feature: modules for general and accent lighting can be combined at will. Warm white to intermediate white colour temperatures are available, thus enabling differentiated and highly flexible illumination. With its outstanding colour rendering quality of Ra > 90, MICROTOOLS is perfect not just for true-to-life presentation in shops but also for the gentle illumination of museum exhibits.

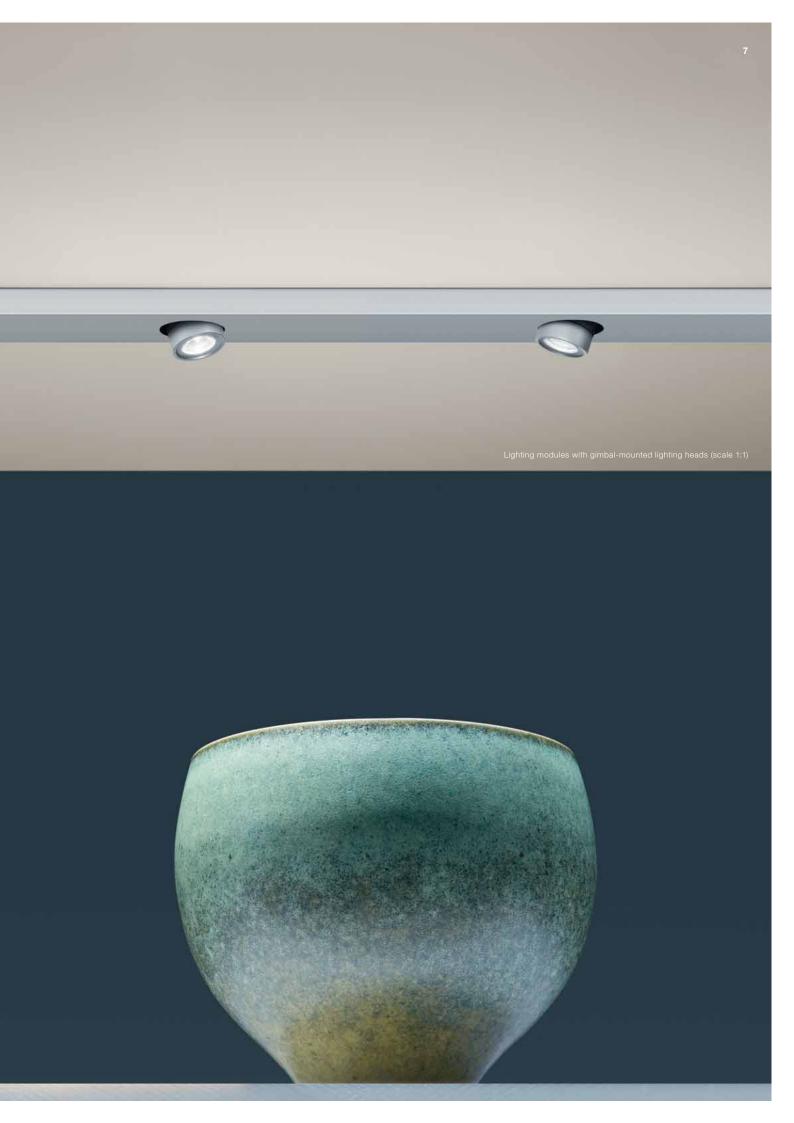






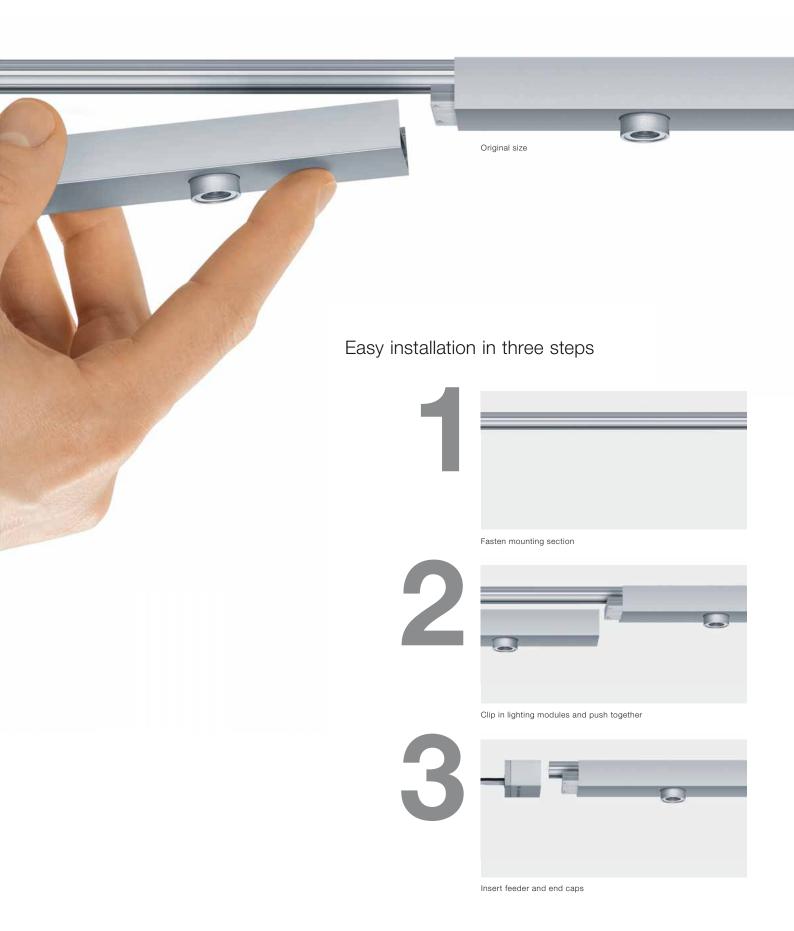






### Systematic flexibility

Rapid installation of individual solutions





#### Efficient lighting points with wide-angle optics

MICROTOOLS modules with fixed lighting heads ensure homogeneous general lighting and, according to the desired lighting effect, can be operated separately or together with gimbal-mounted lighting modules. This enables a wide variety of design options ranging from homogeneous ambient lighting to impressive presentation.



MICROTOOLS 2 x 1.1 W LED: Essential, Ra > 80 (3000 K, 4000 K); Advanced, Ra > 90 (3000 K); with replaceable optics (flood, wideflood)

MICROTOOLS 3 x 1.1 W LED: Essential, Ra > 80 (3000 K, 4000 K); Advanced, Ra > 90 (3000 K); with replaceable optics (flood, wideflood)



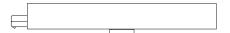


### Flexible accent lighting

#### Gimbal-mounted lighting heads in minimum spaces

Pivoting and rotating lighting heads that are currently the most compact on the market guarantee maximum flexibility, and blend seamlessy into the system. Their dimensions and construction height are identical to those of the fixed spots for general lighting. Despite minimal dimensions, the lighting heads can be aligned with ease thanks to a sophisticated mechanism. The result is that even the smallest details are rendered visible, and distinct shadows create highly recognisable space.





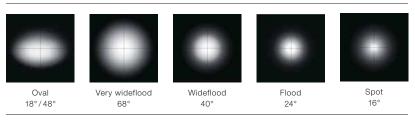
MICROTOOLS-C (Cardanic) 1 x 1.1 W LED: Essential, Ra > 80 (3000 K, 4000 K); Advanced, Ra > 90 (3000 K); with replaceable optics (spot, flood)



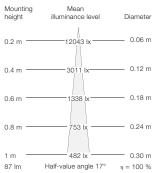
MICROTOOLS-C (Cardanic) 2 x 1.1 W LED: Essential, Ra >80 (3000 K, 4000 K); Advanced Ra >90 (3000 K); with replaceable optics (spot, flood)



#### Lenses



#### MICROTOOLS 1/1.1 W LED 840 SPOT





#### Mounting sections



MICROTOOLS mounting section (1000/2000 mm)



MICROTOOLS mounting section (1000/2000 mm), 20° angle





MICROTOOLS mounting section (1000/2000 mm), 20° angle with cover

#### Blanking inserts, feeders and end caps







90

cd/klm



MICROTOOLS blanking insert (200/400 mm)

MICROTOOLS set feeder/end cap

#### Converters

Article	Control	Signal	LEDs max. number	max. length with single-ended infeed	max. length with double-ended infeed
17 W LED converter (60 010 004)	switchable	-	15	1.50 m	3.00 m
25 W LED converter (60 010 019)	switchable dimmable	- 1-10 V, PUSH	23 16	2.30 m 1.60 m	4.60 m 3.20 m
25 W LED converter (60 010 009)	switchable dimmable	DALI DALI	23 16	2.30 m 1.60 m	4.60 m 3.20 m
40 W LED converter (upon request)	switchable	_	38	3.80 m	7.60 m

### **MICROTOOLS** in shops

A lighting solution with convincing benefits

#### The product has complete attention

The miniaturised LED lighting system promotes the dialogue between customers and the products on offer by placing goods centre stage and by efficiently presenting attractive details. The combination of almost invisibly integrated yet gimbal-mounted luminaires gives new perspectives to planners, shop operators and shop fitters. The goods themselves become attractive eye-catchers thanks to the flexibly alignable luminaires, so that shoppers are tempted to stay and browse. The energetic benefit compared to conventional systems with low voltage halogen lamps is that consumption is reduced significantly.

#### Save energy and protect resources with a durable solution

Energy consumption is considerably reduced if light is emitted not from the ceiling but directly from within the shelves. A further advantage gained by the short distance is that despite less effort the presentation becomes more exciting. Because the LEDs dissipate only low quantities of heat in the direction of illumination, goods are protected from unintended damage and premature ageing. The long service life is a major benefit for the sustainability of the lighting solution; a MICROTOOLS lighting head has a service life of 50,000 hours or more, meaning that in retail practice relamping is no longer required.





#### Discreetly integrated lighting solution

Thanks to the system's reduced size and compact design, it is very easy to integrate MICROTOOLS discreetly into shelving, exhibition furniture and recesses. The LED lighting system (approx. 80 lm/W) with its flexible lighting heads significantly surpasses the efficiency of conventional spots (e.g. HIT: approx. 70 lm/W). Visual integration is especially important where nothing should distract from the presentation itself, even though the finely machined MICROTOOLS components give a good impression in every respect.

#### Setting precise accents

MICROTOOLS make it possible to move significantly closer to goods and exhibits while still remaining inconspicuous. The result is light that accentuates more precisely and differentiates with greater conviction. The ideal combination for accent lighting of point-source LED with low-loss lens optics enables the finest light cones from 16 degrees. Such lighting points create exciting reflections and details are effectively emphasised, and with low effort thanks to the sophisticated gimbal-mounted design of the lighting heads. The individual modules can also be separately dimmed in order to create highly variable lighting scenes.



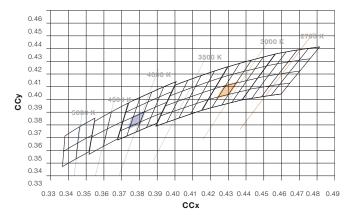
### Notes on lighting quality

When erroneous colouration or heat cause damage...

# Binning – constant colour locations for high quality illumination

When LED chips are manufactured, LEDs from different production batches have variable properties. This may affect luminous flux, the colour location or forward voltage. The importance of such criteria varies according to the application and product. With white LEDs the binning process is especially important, and selecting a specific binning group ensures that the colour location of LED light remains constant. This in turn ensures a uniform appearance for all LED luminaires equipped within the defined binning range. The more precisely this range is limited, the lower are the visible fluctuations.

For this product assortment Zumtobel guarantees 1/16 binning (approximately corresponding to a 2-step MacAdam ellipse, see the diagram below) and therefore a uniform appearance for all LED modules: colour stability is guaranteed over the complete service life (50,000 hours).



The precise selection of LED chips (1/16 binning, coloured sections) guarantees very high colour stability.

### Colour rendering for authentic presentations

Modern LED lighting solutions achieve a very high level of colour rendering. With Ra values of over 90, they even surpass many lighting systems with fluorescent lamps. And LED solutions also stand up well to comparisons with discharge lamps, being able to keep pace both in terms of colour rendering and other photometric characteristics.

Zumtobel sources LED products from various manufacturers. With regard to the colour rendering of LEDs, the following facts are significant: with single-chip LEDs with a blue DIE (light-emitting component) and yellow phosphor, the standardised colour rendering in the warmer colour temperature range is usually higher. The energy-rich blue light is excited by the phosphor to illuminate. But not all of the blue light is transformed: the resulting additive mixing of the spectral colours thus produces white light. Colours should be reproduced as naturally as possible by selecting corresponding phosphor mixes. Unfortunately, the efficiency of warm white LEDs is usually less than intermediate or cool white LEDs. The phosphor mix is modified with a cooler colour temperature. LEDs with cooler light colours are usually more efficient but are characterised by lower colour rendering.

All MICROTOOLS lighting modules in the 'Advanced' version are offered with a colour rendering value of Ra > 90. This system ensures that products and exhibits retain their natural appearance with artificial lighting as well.

### Lighting sensitive objects with gentle light

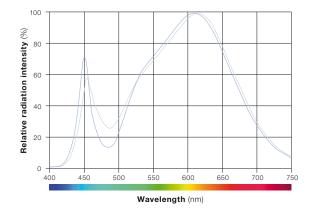
From a conservational point of view, it is important to handle valuable and sensitive exhibits in museums with special care. If light is not correctly applied it may damage exhibition objects. The task is therefore to use a suitable lighting solution with adequate lighting to present the objects with care and yet still effectively. It is especially important to keep damaging infrared and ultraviolet radiation and high illuminance levels as low as possible. If these factors are adhered to then the risk of colours fading or sensitive materials becoming damaged is minimised significantly. It may generally be assumed that the greater the colour rendering and the warmer the colour temperature, the lower is the potential for damage from the LEDs.

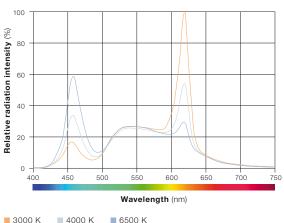
It is important for glare to be avoided so that visitors can recognise the exhibited objects well. A high level of energy efficiency and long maintenance intervals with the lighting also helps to ensure low-effort museum management.

Find out more about modern museum lighting in Zumtobel's Art and Culture application brochure.

#### The advantages of LED technology integrated in **MICROTOOLS:**

- Even without supplementary protective measures, the carefully selected LEDs have less than or equal IR and UV radiation as conventional light sources with filters.
- The focused light and high colour rendering of Ra > 90 are outstandingly suited to accent lighting.
- Maintenance effort is significantly reduced thanks to the light sources' especially long service life of 50,000 hours.
- MICROTOOLS lighting modules are extremely energy-efficient. Thus, they protect not only the exhibits but also the environment and your budget.





■ 4000 K

■ 6500 K

■ MICROTOOLS Essential (Ra > 80) ■ MICROTOOLS Advanced (Ra > 90)

### **DALI** lighting control

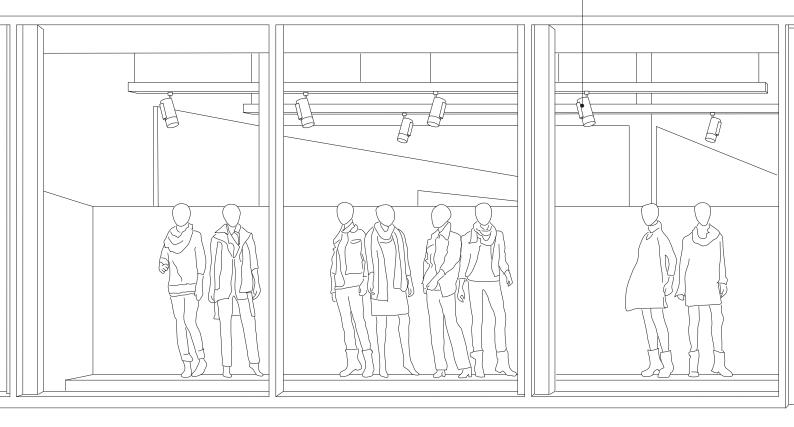
Highly varied luminaires work as a team

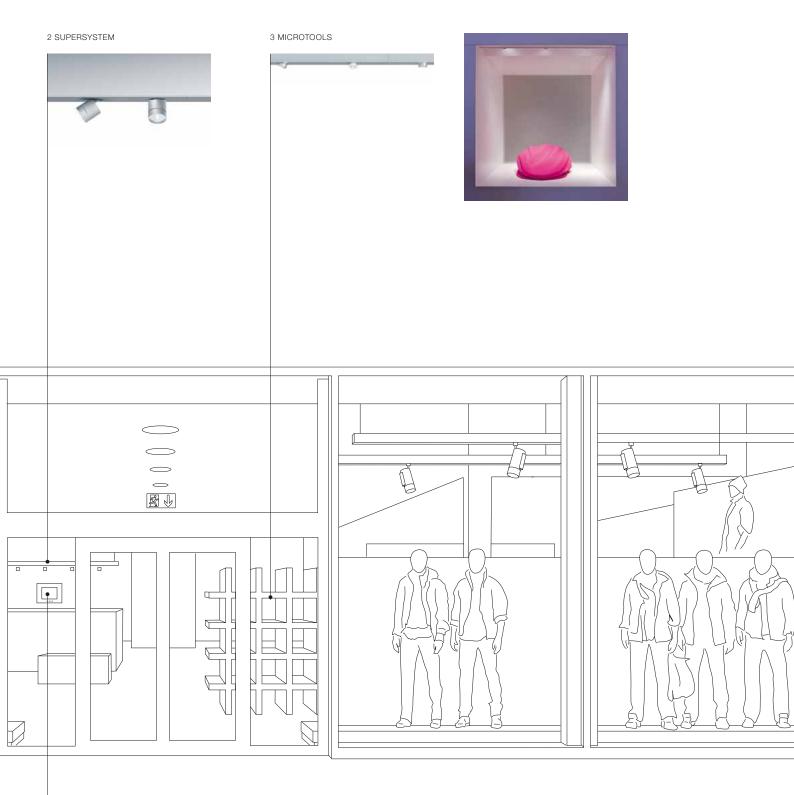
#### Tried-and-tested and universal

The DALI control system used by Zumtobel features maximum compatibility. Dimensioning has no relevance – high-performance spots in all sizes and wattages as well as the flexible SUPERSYSTEM and MICROTOOLS lighting systems can be coupled and jointly controlled. In shop environments in particular, interesting moods can be created and can be varied according to ingress of daylight, number of visitors and the season of the year. Anything goes: programming in real time, automatisms dependent upon sensors or predefined sequences.

1 ARCOS







The EMOTION touch panel makes operation and programming of dynamic light changes very simple. Intensity and colour as well as personalised lighting scenes can be called up at the press of a button.

MICROTOOLS can be controlled via DALI with:

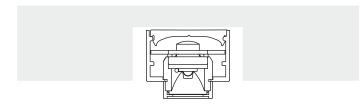
- CIRCLE KIT
- DIMLITE
- LUXMATE EMOTION
- LITENET

### **Diversity of solutions**

via three mounting sections

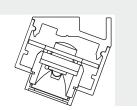
#### Standard mounting section

The standard mounting section is ideal for installation in wooden shelves and for surface-mounting, and is rapidly and securely fixed with screws, magnetic tape or adhesive tape.



#### **Inclined mounting section**

Practical for installing to the rear walls of shelves and recesses: the mounting section inclined inwards by 20 degrees guides light directly onto the goods.



#### Mounting section with cover

This mounting section features a silver anodised cover and a module position inclined inwards by 20 degrees, making it especially ideal for shelves of glass and metal. The cover at the front end ensures an elegant termination and completely conceals the light modules.



#### **MICROTOOLS** lighting modules, fixed



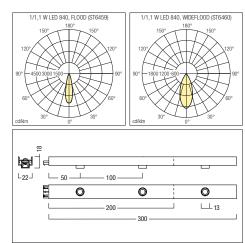




- 850°C Premium binning for maximum colour stability (MacAdam 2)
  - UV-free and IR-free light
  - Lighting modules can be plugged together easily; no additional through-wiring necessary
  - Material: extruded aluminium section in silver-anodised finish
  - 2-piece LED spotlight unit made of milled aluminium in silver anodised finish with COOL TOUCH polycarbonate front ring
  - Colour temperature: 3000 K (LED830/930: warm white) or 4000 K (LED840: neutral white)
  - Colour rendering: RA>80 (Essential), RA>90 (Advanced)
  - Electrical power supplied via power feed kit; please order separately
  - Please order converter separately (350 mA)
  - Front ring of lamp unit designed to accommodate interchangeable lens or oval-outline lens
  - Lighting modules with fixed LED lamp units for general lighting
  - Flood (24°) or Wideflood (40°) beam pattern

	Order no.
Lighting module with 2 LED lamp units (Essential), fixed	
2/1,1 W LED 830, flood	60 210 420
2/1,1 W LED 830, wideflood	60 210 422
2/1,1 W LED 840, flood	60 210 421
2/1,1 W LED 840, wideflood	60 210 423
Lighting module with 2 LED lamp units (Advanced), fixed	
2/1,1 W LED 930, flood	60 210 428
2/1,1 W LED 930, wideflood	60 210 429
Lighting module with 3 LED lamp units (Essential), fixed	
3/1,1 W LED 830, flood	60 210 424
3/1,1 W LED 830, wideflood	60 210 426
3/1,1 W LED 840, flood	60 210 425
3/1,1 W LED 840, wideflood	60 210 427
Lighting module with 3 LED lamp units (Advanced), fixed	
3/1,1 W LED 930, flood	60 210 430
3/1,1 W LED 930, wideflood	60 210 431
Accessory	
Oval outline lens (set of 10)	60 210 467
replaceable lens with flood beam pattern (set of 10)	60 210 464
replaceable lens with spot beam pattern (set of 10)	60 210 463
replaceable lens with very wide-beam flood pattern (set of 10)	60 210 466
replaceable lens with wideflood beam pattern (set of 10)	60 210 465

Light distribution characteristic only shown for one lamp unit



#### MICROTOOLS lighting modules, gimbal-mounted



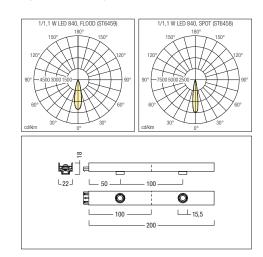




- Premium binning for maximum colour stability (MacAdam 2)
- UV-free and IR-free light
- Lighting modules can be plugged together easily; no additional through-wiring necessary
- Material: extruded aluminium section in silver-anodised finish
- 2-piece LED spotlight unit made of milled aluminium in silver anodised finish with COOL TOUCH polycarbonate front ring
- Colour temperature: 3000 K (LED830/930: warm white) or 4000 K (LED840: neutral white)
- Colour rendering: RA>80 (Essential), RA>90 (Advanced)
- Electrical power supplied via power feed kit; please order separately
- Please order converter separately (350 mA)
- Front ring of lamp unit designed to accommodate interchangeable lens or oval-outline lens
- Lighting modules with gimbalmounted LED lamp units for accent lighting
- Lamp unit can tilt through ±20° and rotate through ±75°
- Spot (16°) or Flood (24°) beam pattern

	Order no.
Lighting module with 1 LED lamp unit (Essential), gimbal-mounted	
1/1,1 W LED 830, flood	60 210 434
1/1,1 W LED 830, spot	60 210 432
1/1,1 W LED 840, flood	60 210 435
1/1,1 W LED 840, spot	60 210 433
Lighting module with 1 LED lamp unit (Advanced), gimbal-mounted	
1/1,1 W LED 930, flood	60 210 441
1/1,1 W LED 930, spot	60 210 440
Lighting module with 2 LED lamp units (Essential), gimbal-mounted	
2/1,1 W LED 830, flood	60 210 438
2/1,1 W LED 830, spot	60 210 436
2/1,1 W LED 840, flood	60 210 439
2/1,1 W LED 840, spot	60 210 437
Lighting module with 2 LED lamp units (Advanced), gimbal-mounted	
2/1,1 W LED 930, flood	60 210 443
2/1,1 W LED 930, spot	60 210 442
Accessory	
Oval outline lens (set of 10)	60 210 467
replaceable lens with flood beam pattern (set of 10)	60 210 464
replaceable lens with spot beam pattern (set of 10)	60 210 463
replaceable lens with very wide-beam flood pattern (set of 10)	60 210 466
replaceable lens with wideflood beam pattern (set of 10)	60 210 465
Political design for the second design of the second secon	

Light distribution characteristic only shown for one lamp unit



#### **MIICROTOOLS** mounting sections



- Lighting modules can be fitted in mounting sections without tools
- Material: extruded aluminium section in silver-anodised finish
- Optionally available with tilted lighting module (20° angle)
- Optionally available with back screen and tilted lighting-module mount (20° angle) for glass and metal bases

#### Mounting sections

1000 mm	60 210 447
1000 mm, 20° inclination	60 210 449
1000 mm, 20° tilt and screen	60 210 451
2000 mm	60 210 448
2000 mm, 20° tilt	60 210 450
2000 mm, 20° tilt and screen	60 210 452



21

Order no.

Order no.

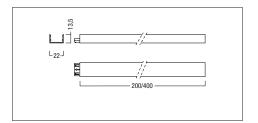
Order no.

#### **MICROTOOLS** blanking insert



- Blanking insert with electrical through-wiring closes space between light modules flush with surface
- Material: extruded aluminium section in silver-anodised finish

60 210 444 Blanking insert 200 mm Blanking insert 400 mm 60 210 445

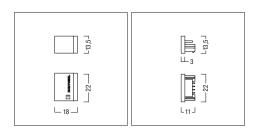


#### **MICROTOOLS** accessories



- Power-feed kit: electrical end feed for lighting modules plus end cap for terminating a circuit
- Power/connecting leads (4-pole) for electrical connection of lighting modules
- Converter (350 mA), switched and dimmable DALI or 1-10 V, for current-controlled operation of lighting modules

Accessory	
Feed-in set Electrical power feed / end cap	60 210 446
Connecting lead (4-pole) for converter 1000 mm,	
with plugs/ferrules and plug/socket screw connection	60 210 460
Connecting lead (4-pole) for converter 2000 mm, with plugs/ferrules	60 210 462
Connecting lead (4-pole) for converter 2000 mm,	
with plugs/ferrules and plug/socket screw connection	60 210 461
Connecting lead (4-pole) 400 mm, with plugs/ferrules	60 210 458
Connecting lead (4-pole) 600 mm, with plugs/ferrules	60 210 459
Converters	
LED control gear 17 W, 350 mA, 220-240 V	60 010 004
LED control gear 50 W UNI (350-1400 mA) 1-10 V, 110-240 V AC	60 010 019
LED control gear 50 W UNI (350-1400 mA) Dali, 220-240 V AC	60 010 009

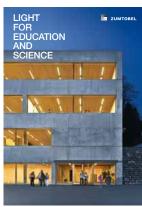




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## Zumtobel is the internationally leading supplier of integral lighting solutions for professional interior and exterior lighting applications.

- Offices and Communication
- Education and Science
- Presentation and Retail
- Hotel and Wellness
- Art and Culture
- · Health and Care
- Industry and Engineering
- Façades and Architecture

We provide unique customer benefits by integrating technology, design, emotion and energy efficiency. Under the Humanergy Balance concept, we combine the best possible ergonomic lighting quality for an individual's well-being with the responsible use of energy resources. The company's own sales organisations in twenty countries, as well as commercial agencies in fifty other countries, form an international network of experts and design partners providing professional lighting consulting, design assistance and comprehensive services.

#### Lighting and sustainability

In line with our corporate philosopy "We want to use light to create worlds of experience, make work easier and improve communications and safety while remaining fully aware of our responsibility to the environment", Zumtobel offers energy-efficient high-quality products, while at the same time making sure that our production processes based on the considerate use of resources are environmentally compatible.

#### zumtobel.com/sustainability

Order no. 04924205-EN 06/11 © Zumtobel Lighting GmbH Technical data was correct at time of going to press. We reserve the right to make technical changes without notice. Please contact your local sales office for further information. For the sake of the environment: Luxo Light is chlorine-free paper from sustainably managed forests and certified sources.



### Top quality – with a five-year guarantee.

As a globally leading luminaire manufacturer, Zumtobel provides a five-year guarantee for its complete product range with effect from 1 April 2010.

zumtobel.com/guarantee



### **ZUMTOBEL**



Track and spots

Modular lighting systems



Down-/Uplights



Recessed luminaires



Surface-mounted and pendant luminaires



Task, wall and uplights



Continuous row and batten luminaires



High-bay luminaires



Luminaires with extra protection



Lighting management



Emergency lighting

Medical supply systems



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www.zumtobel.com



### **MICROTOOLS**

Modular LED lighting system

Impressive presentation in minimum spaces