ACP LUM Luminance sensor

Adjustment of lighting in road tunnels according to environmental conditions

SOLID STATE TECHNOLOGY

ACP Environment AG/SA – Schützenhausweg 6 CH-2572 Sutz, Switzerland
Tel +41 32 333 70 60 Fax +41 32 333 70 61
Email : info@acpsa.ch
www.acpsa.ch

METAS

APPROVED AND CERTIFICATED

ACP LUM - Luminance measurement

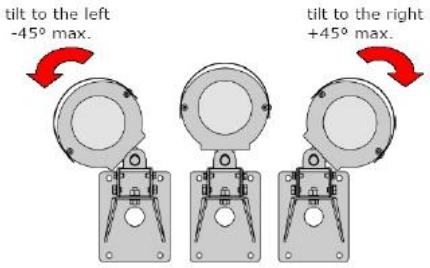
The ACP LUM sensor is a debilitating new measurement system based on a CMOS (Complementary Metal-Oxide-Semiconductor) image sensor with fixed focal length lenses and interfaced with an embedded system.

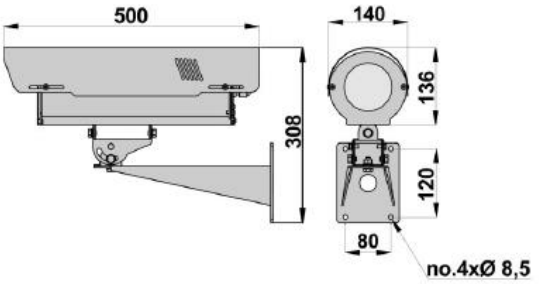
The lighting requirements of the lighting system of a road tunnel, in order to ensure that the driver of a vehicle, both day and night, can enter, cross and exit the covered section at a speed at least equal to the limit of local speed, with a level of safety no less than that present in the sections of road to which the tunnel is part, in adequate conditions of visual comfort.
In the entrance area of a road tunnel, it is expected that the street luminance must be correlated to the external one; neither too low nor too high to avoid not seeing a possible obstacle in one case, and being dazzled in the other.
ACP LUM connects to road tunnel acquisition and control systems via a 4-20mA line and optionally via a Modbus RTU communication protocol. The innovation of the ACP LUM lies in the use of CMOS image sensors combined with a luminance calculation algorithm in the advanced features that allow to set the device parameters through a WEB interface and in wireless connection that guarantees a more accurate procedure of installation. Furthermore, at the standard output of 4-20 mA and relay contact for fault, the instrument can acquire various instruments, such as measurement of wind speed and direction (weather station), external temperature and humidity measurement sensors, etc. always with analogue and digital outputs or via ModBus RTU serial.

The ACP LUM Monitor parameterization software with wireless connection allows to see exactly the tunnel entrance, thus allowing perfect alignment of the lumen meter. Controls and settings via APP software (APP on mobile phone) of the values constitute a facilitation for the commissioning and quality of the measurement.

Main characteristics

- Lumen meter with CMOS L20 debilitating measuring principle
- Zoom optics for setting the measuring range 1-32°
- Programmable measurement ranges from 10 cd/ to 10000 cd/m2
- Electronically controlled heating and temperature control
- IP67 certified waterproof
- Stainless steel 1.4571 Inox AISI 316L
- Mounting flange for adjusting the required horizontal and vertical tilt angle
- Wall mounting arm in AISI 316L stainless steel
- Clean glass system that keeps the front glass always clean from dust deposits
- ACP LUM certified METAS Swiss Norm "ISO/CIE 19476:2014 (CIE S 023/E:2013). Certificate 116 05509 Master





System structure

- Photometer in camera housing (luminance camera) mounted on the road tunnel wall or on a pole in front of the road tunnel portal
- Connection to power supply voltage (230 VAC)

Advantages

- Innovative and precise system for measuring cd/m2 at the road tunnel portal
- Tested and verified according to METAS Switzerland ISO/CIE 19476:2014 (CIE S 023/E:2013)
- Developed in collaboration with researchers and engineers from DTI and ISEA
- Wireless connection to luminance camera APP
- Measurement range 0-10000 cd/m2 with different levels of parameters (to be communicated when ordering)
- No moving parts
- Analog and digital interfaces
- Optional: RS485 ModBus RTU
- Acquisition of various peripheral instruments such as external probes for measuring temperature, humidity, anemometers, etc.

Norms and directives

- METAS Switzerland/Suisse/Schweiz International Standard ISO/CIE 19476:2014 (CIE S 023/E:2013)
- CE declaration of conformity
- ASTRA Switzerland directives e Guidelines and technical manual for operating and safety equipment (BSA) 13005
- CH VSS 40 551 Public lighting in road tunnels, tunnels and underpasses
- RATB Germany
- IT UNI 11095:2021
- Guidelines for the construction and operation of road tunnels
- Electromagnetic Compatibility (EMC):
- EN IEC 61000-6-3:2021
- EN 50130-4:2011 + A1:2014
- EN50081 EMV Interference emission
- EN50082 EMV
- Sensitivity to interference
- IEC 801-3 EMV Interference immunity
- Directive 2014/35/EU LVD
- Electrical safety
- EN IEC 62368-1:2020 + A11:2020 + AC:2020
- EN 60529 :1991 + AC:1993 + A1:2000 + A2:2013 + AC:2016 + AC:2019
- Restrictions on the Use of Certain Hazardous Substances Directive (RoHS Directive)
- 2015/863/EU Delegated Directive amending Annex II to Directive 2011/65/EU of the European Parliament and of the Council as regards the list of restricted substances
- EN IEC 63000:2018

ACP LUM – Luminance measurement

Technical data

Luminance camera

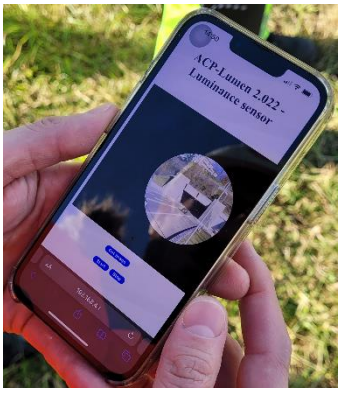
Description	ACPLUM
Measured value	Luminance cd/m2
Measuring range	Selectable 0…10000 cd/m2
Image angle	1°…32°
Analog output	1 x 4-20 mA
Ralay contact	1 x function / error (NC)
Analog output	Optional 4 x 4-20 mA (external sensors) Galvanically isolated
Relay	Optional 4 x function / error (NC)
Serial output	Optional RS 485 ModBus RTU
Power supply	230 VAC / 50 Hz +/- 10 %
Consumption	Ca. 20 W

Case and installation

Dimensions (lxhxd)	140 x 136 x 500 mm (without fixing flange)
Protection level	IP 67
Material	Stainless steel AISI 316 L
installation accessories	Optional Adjustable wall console Pole console with fastening clamps

Software APP

The ACPLUM Monitor allows you to capture Real-time images, adjust the focus angle, simulate mA test outputs, check in direct luminance measurement, monitor the status of the relay and the operating LED etc.



ACP Environment AG/SA – Schützenhausweg 6 CH-2572 Sutz, Switzerland
Tel +41 32 333 70 60 Email: info@acpsa.ch
www.acpsa.ch

METAS
APPROVED AND CERTIFICATED