Technical Information

Electronics – Rain/light/solar sensor

HELLA®

Ideas today for
the cars of tomorrow

The use of rain/light/solar sensors in vehicles increases both safety in road traffic and driver and passenger comfort. Visibility and attention to the traffic situation are improved. Switching on the vehicle's lights at the right time makes the vehicle significantly more visible to other drivers, particularly in twilight situations. In adverse weather conditions, the rain sensor function reduces the strain on the driver by automatically controlling the wiping process.

At Hella, many years of know-how in the development of optical and electronic systems forms the basis for development of these opto-electronic devices. Thanks to integration competence and strategic partnerships, our customers are supplied with complex systems solutions from a single source.

For example, modules are developed with interior mirror suppliers that integrate other components in addition to the rain/light sensors, such as a solar sensor, a humidity sensor or a camera system. This ensures that our customers' demanding requirements can be met in terms of functionality, package space, costs and quality in future applications.

The technologies used, as well as the structure and connection technology, are subject to ongoing development. In this context, a capacitive rain sensor is currently under development which senses the rain through an almost invisible aerial structure in the windshield.

Rain/light/solar sensor

Integration of camera + rain/ light/solar sensor in the mirror base

Rain/light/solar sensor

Hella's combined rain/light/solar sensor includes the functions for automatic wiper control (rain sensor) as well as automatic light switching (light sensor). To optimize climate control in the vehicle, the direction of incidence and radiation intensity of the sun are also determined (solar sensor).

Two separate optics in the light sensor map the ambient light as well as the light in front of the vehicle. This allows lighting situations such as day, twilight or night as well as passing through tunnels or under bridges to be mapped accurately.

The rain sensor uses IR transmitters and receivers to evaluate the amount of moisture on the windshield. The regulation ranges from individual wipes through a selection of suitable interval cycles to permanent wiping at an appropriate speed.

The two-quadrant solar sensor detects the intensity of solar radiation separately for the driver and passenger sides. It provides the automatic air conditioning unit information for individual interior climate control.

The integrated micro-controller in the sensor allows the output signal to be matched to specific customer requirements. A modular design makes it possible to combine the rain, light and solar functions according to the required application.

The integration of a humidity sensor will further extend functionality in the next generation. The humidity sensor detects windshield temperature and humidity and supplies the air conditioning control unit with data to prevent the windshield from fogging up.

The sensor is attached by a retaining ring on the windshield. A bubble-free optical connection is ensured with the aid of a flexible coupling pad.

Attaching the rain/light/solar sensor

The snap-in process with a pressing force of <40 N makes a simple, safe and economical attachment process possible with no additional mounting tools needed.

Voltage range	9 to 16 V
Current consumption/quiescent current	<30 mA/<0,3 mA
Interfaces	LIN 1.3, LIN 2.0, K-line, PWM
Temperature range	–40 °C to +85 °C
Dimensions without ring, spring (H/D)	24 mm/49 mm
Weight	<45 g

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