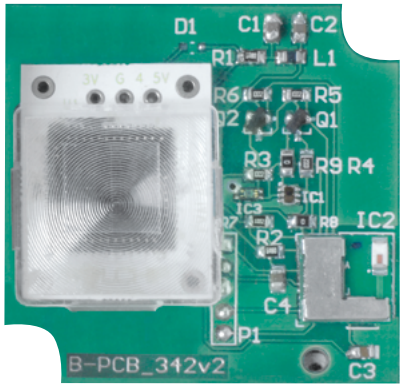

EHA sensor

Energy Harvesting Ambient Sensor for Tunable White control

EHA Sensor is sensor of illuminance and correlated colour temperature that uses energy harvesting from photovoltaic cell for biasing and Bluetooth Low Energy for the communication. EHA Sensor is intended as data provider for the regulation of variously addressed Tunable White luminaires via BlueBridge. Wireless biasing allows for simple usage in the interiors and direct measurement of light quality in various applications.

Light quality is a very important factor in human wellbeing. In addition to lighting intensity, Correlated Colour Temperature (CCT) – the colour of white light – also has a fundamental influence on our mood and performance. The possibility of CCT regulation, called Tunable White, has in recent years become a standard aspect of higher-class lighting solutions. To meet this need, manufacturers have developed a variety of Tunable White control methods ranging from manual and remote control to wired-protocol controls such as DALI. More complex control devices even offer the possibility of dynamic daylight simulating CCT regulation across a set time period, such as throughout the day, to support the healthy functioning of the circadian rhythm. However, no matter how complex the algorithms of CCT regulation are, they can never facilitate dynamic reactive control based on measured ambient CCT values unless there is a sensor to provide feedback measurement.

The advantages of using ambient light sensors to regulate lighting intensity are well known. In addition to this, iLumTech has already developed the innovative DALI Ambient Sensor, which is capable of sensing not only ambient light levels but also ambient CCT values. The DALI Ambient Sensor is directly connected to a DALI bus, making it possible to configure it directly to measure ambient lighting intensity and CCT values and, if desired, additionally regulate the illuminance and CCT output of connected luminaires. However, such wired connection restricts the mounting of the sensor to ceilings only as the presence of DALI wiring would be inappropriate and limiting in any other relevant location, such as on a table top. Ceiling mounting also means that sensors can only be placed in one static location, necessitating the use of several sensors to cover larger areas, even if they are not used regularly. What's more, measurements taken by statically located sensors can be negatively affected by objects and surfaces under the sensor as it only measures reflected light, especially if those objects and surfaces have non-ideal reflectivity. This issue can, however, be eliminated by proper sensor calibration. Another limitation of ceiling mounted sensors is that they measure light from luminaires reflected from a range of surface colours, which has a modified spectrum due to reflection. To achieve accurate measurement data about the light emitted from luminaires, it is necessary that sensors sense it directly – in other words, the ideal location for an ambient lighting intensity and CCT sensor is on the table top. In answer to this dilemma, iLumTech have developed a wireless ambient lighting intensity and CCT sensor. Wireless both in terms of communication and power supply.

We live in an era of smart and environmentally responsible technologies; a trend necessarily becoming central in the lighting control industry. Every light source represents a natural source of energy, energy that is almost entirely wasted. Wouldn't it be great to harness that wasted energy and redirect it for use elsewhere? iLumTech has combined its existing Ambient Sensor technology with smart technologies to bring to the market the Energy Harvesting Ambient (EHA) Sensor, which is powered by a photovoltaic cell. The size of the cell is a compromise between optimised harvesting and practical application. Depending on the location of the sensor, it is able to make up to five measurements per minute, with the data needing to be read by a control device to facilitate lighting regulation. The Bluetooth Smart (Bluetooth 4.1) interface is used for wireless transmission of the measure data. As there is not enough energy supplied by the photovoltaic cell to establish connectivity, the data is broadcast transmitted using advertising mode. Now that Bluetooth Smart is becoming a standard feature of smartphones and tablets, the data transmitted by the **EHA Sensor** can easily be read by almost any Android device with the appropriate app installed.

To facilitate control, iLumTech has developed BlueBridge, and interface between Bluetooth Smart and standard DALI buses. BlueBridge is powered directly from the DALI bus and so does not need any power source. Using BlueBridge allows for complete control via a DALI installation, even of type 8 devices (colour control). The GUI is an app that runs on Android devices that support Bluetooth Smart. The control features of BlueBridge can be used generally for any type of DALI installation where the range of Bluetooth Smart is sufficient (up to 50 m without obstacles). Furthermore, BlueBridge is fully compatible with the **EHA Sensor**. Using the app, users can configure a simple regulation loop that reads data from an **EHA Sensor** and control Tunable White luminaires (defined by group addresses) using BlueBridge as an interface with the DALI bus.

The **EHA Sensor** is a pocket-sized solution for accurate and realistic measurement of ambient lighting intensity and CCT values at task areas in offices and homes. In combination with BlueBridge and compatibility with Bluetooth Smart, it allows for comfortable data presentation and wireless control of DALI installations (exclusive of the wiring of the luminaires).

Key features

- Biasing from photovoltaic cell, no power supply needed
- Illuminance and CCT sensing
- Wireless communication using Bluetooth Low Energy
- Simple installation

Wiring

No wiring

Input parameters

No extra biasing

Mechanical data

IP coverage	IP20
Weight	150 g
Dimension	40 x 40 x 20 mm

Operational conditions

Temperature range	from 0 °C to 40 °C
Relative humidity	85 % (non-condensing)
Storage temp. range	-40 °C - +70 °C

Function

EHA Sensor senses the light conditions in the area – illuminance in luxes and correlated colour temperature (CCT) in Kelvins. The measurement runs automatically with automatic range switching. The range of measured illuminance is from 100 lx to 12,000 lx. The range of CCT measurement is from 2500 K to 8000 K. For the communication the sensor uses Bluetooth Low Energy. Due to the energy harvesting biasing circuit the measurement period can be up to 20 seconds depending on the ambient light level.

Energy Harvesting Ambient Sensor for Tunable White control

iLumTech™
Innovation ahead

WHO WE ARE

The iLumTech motto "innovation ahead" came to life around 15 years ago. Since then, we have been deeply involved in the development of luminaires and all connected design and engineering services. The result is that today, we are a market-leading independent research and development centre located in Central Europe.

With more than 60 employees, extensive expertise across optical, thermal, electronic, and mechanical engineering as well as software and hardware design, we are in a position to provide uniquely comprehensive services. We listen to and follow the needs of customers and use our experience to offer the most flexible support.

Our offer

- EXPERIENCED ENGINEERS
- PROFESSIONAL OUTPUTS
- CONFIDENTIAL NDA APPROACH
- FULLY EQUIPPED R&D
- FUTURE ORIENTED THINKING
- CONTINUOUS SERVICES

Our services

Full luminaire development

We provide solutions for luminaire manufacturers that cover everything from concept to release of the product to the market.

Design & engineering services

We are home to experienced experts from many fields who enable us to support customers with a wide range of individual design and engineering services.

Laboratory services

We have some of the best-equipped laboratories in Europe and can provide customers with an array of optical, thermal, electronic, and mechanical tests side-by-side with other services.

Further OEM support

We offer customers the option to continue with the manufacture of developed luminaires, optical systems, and electronic solutions at trusted facilities close to our company.

Proprietary components & devices for the lighting market

We bring to the market a range of unique lighting control devices under the brand name Connected Lighting, as well as original Optical Solutions and LED Units.

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HEAD OFFICE
iLumTech
906 02 Dojč 419
Slovakia
Email: info@ilumtech.eu
www.ilumtech.eu