

## **Circadian Check MSS1000**

For us human beings light is more than just illumination. Natural light regulates the metabolism, the hormonal balance and strengthens the immune system. Light is necessary for our well being! For this effect not the brightness is important but the light concentration. By the influence of natural or natural build after light the body's defences are strengthened. Therefore the number of sick days of employees is reduced and the efficiency increases.

The Circadian Check is the first meter, that allows to determine the illumination- as well as the well being situation.

## **Illumination at the Workplace**

Particularly offices with monitor workstations, but also in assembly and production areas the well being, the productive efficiency and also the health depends directly on the illumination. Reflections on the screen, low illumination or bright artificial light tire the eyes faster and the concentration is reduced. Nearly half of all employees working on a monitor workplace suffer headache and eye disturbances. With our newly designed **Circadian Check** you are able to find failures in the illumination of the workplace and create a healthy and relaxing working illumination.

## **Healthy Illumination Techniques**

A balanced illumination in private as well as in working surroundings is essential for a healthy life. The progress in light technology has been immense within the past years, so that it is possible to adjust the illumination level for daylight as well as for artificial light individually by mechanical and/or electronic controls. When designing new rooms, the health should be in focus. The experiences in medicine and biology of the last decades can be used to realize higher levels of illumination. The controllability of the individual light colours and brightness are already possible when designing single rooms or areas. By this the illumination supports a healthy working and prevents disturbances. Illumination must serve peoples health.

## **Circadiane Photoreceptors in the Eye**

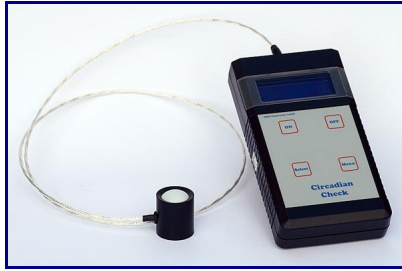
Parts of the biological inner clock are called circadian rhythm. The retina of the eye is directly connected to the human day-night-rhythm. This rhythm is controlled by light absorbed by the retina. When this light assimilation by the retina falls away, e.g. blind people, this rhythm is mixed up and the day-night-borders melt. The biological clock gets overbalanced.

## **Circadiane Rhythmik**

During evolution mankind has adopted to the day-night-rhythm. The inner clock reacts to daylight and seasons, to illuminations and the changeover from day to night. In addition to the seeing by rods and cones on the retina we have a chronological orientation. The biological clock controls our sleep-wake-behavior and has high influence to the vegetative nerve system and our hormones. The inner clock depends on light- and darkness-impulses. By technical light sources, the inner clock can be disturbed. In case of insufficient daylight (supply) standard light sources should not be used as compensation. Lack of daylight can occur depending on seasons or weather. But also the technical necessity of workplace setup or late working times at night may lead to this. The inner clock should always be stimulated when we have a deficit of daylight.

With the implementation of fluorescent lamps at workplaces, rooms were better illuminated and the inner clock was significantly influenced. However, this influence is not directed and by far not used systematically enough.

## **Circadian Check MSS1000**



## **Light Management in the Seniorit**

With growing age falling asleep gets harder and we awake earlier in the morning. Not only our sleep-wake-behavior is weakened in the seniority, also our light demand rises. This demand can be satisfied by staying outside. But due to sanitary and social circumstances older people more and more retreat to their houses. Due to decreasing sight seniors need higher illuminations than younger people to be able to care for themselves. In private living quarters as well as in retirement homes this particularity is not considered.

## **Circadian Light Management**

Before the electric light was invented, the sleep and the social life during the day were dictated by the darkness. Improvement of light sources during the last years enables us to use them to influence the inner clock as well as activating effects of the light to improve the fitness for work. The sleep-wake-behavior can be influenced, the inner clock can be adjusted, the adjustment can be accelerated or an existing adjustment can be reduced.

With the **Circadian Check** the illumination can be applied for circadian light management. It can for example contribute to increase the effectiveness during shift operation. By easy measurement the suitable illumination for every working situation can be found.

## **Disorders caused by Light Deficit**

Light deficit can cause depression. Presumably depression has always existed. In 1962 the correlation between human day-night-rhythm and shift work in connection with depression has been indicated for the first time. Beginning of the 80th more and more publications were made that concerned circadian rhythm.

Such disorders can now belong to the past. A simple measurement with the **Circadian Check** enables you to determine the actual illumination and the individual well-being illumination.

# **Light and Architecture**

Our organism depends involuntarily and unconsciously directly on the circadian rhythm. Our eye does not only enable seeing. It also controls motor and hormonal processes. This is the reason why we experience rooms with a „space perception“.

Our biologically existential room sensation is mainly defined by the brightness. But our mental sensation and the impression are notably defined by the brightness- and color-ratio. Impression is the perception of the room that causes well-being or indisposition in us. The impression influences our constitution, our well-being and our behavior. Also the motivation, relaxation or depression is controlled by the impression and the sensation that we feel in a room. Using the correct illumination for a room we can cause short term well-being for our visitors as well as safe the health of our employees on a long term.

Influencing the impression of a room is a piece of cake with the help of the **Circadian Check!** By a simple measurement and determination without big efforts every room can be designed individually and constitutional.



*Age, lens transmission and the circadian effectiveness of solar and of lamp radiation.*



*Measurement of Circadian Effective Irradiance and Radiant Exposure (Dose).*

Subject to technical changes.