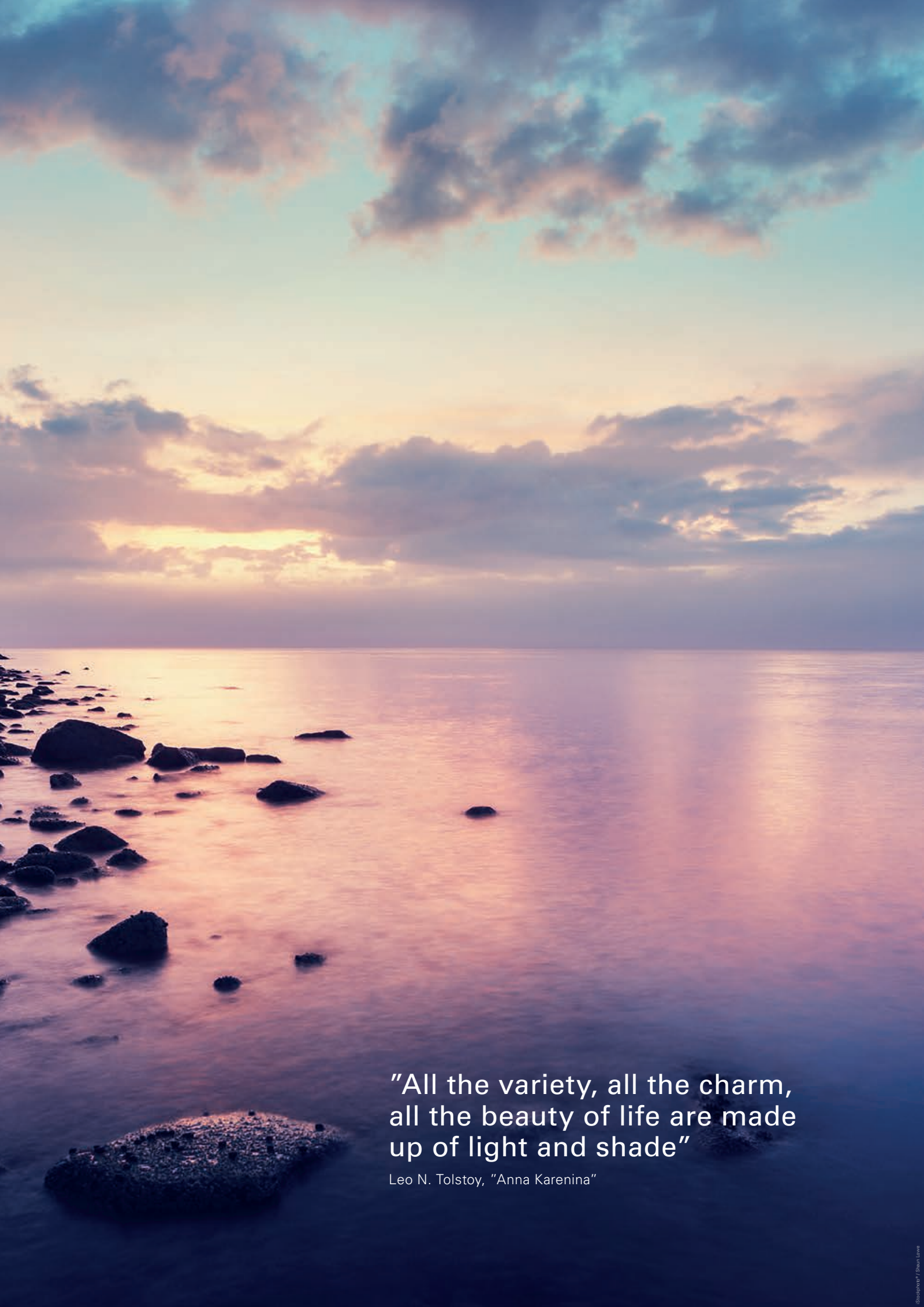

VISUAL TIMING LIGHT
BIODYNAMIC LIGHT IN ELDERLY CARE





“All the variety, all the charm,
all the beauty of life are made
up of light and shade”
Leo N. Tolstoy, “Anna Karenina”

CONTENTS

VISUAL TIMING LIGHT

	PAGE	
MAN AND LIGHT	4	NATURE AS A MODEL
	6	THE THIRD DIMENSION OF LIGHT
	8	THE INTERNAL CLOCK
	10	BIOLOGICALLY EFFECTIVE LIGHT
	12	VISUAL TIMING LIGHT (VTL)
SENIORS	14	BETTER LIGHTING FOR THE ELDERLY
	16	DEMENTIA
ADDED VALUE	18	ADVANTAGES FOR RESIDENTS
	20	ADVANTAGES FOR CAREGIVERS
	22	BENEFITS FOR OPERATORS AND HOME MANAGERS
VTL-SYSTEM	24	THE LIGHT MANAGEMENT SYSTEM VTL
	26	THE VTL-COMPONENTS

NATURE AS A MODEL AND A LITTLE BIT BETTER

Light is everything in nature. It provides growth, diversity and beauty. We humans are a part of nature. Light is therefore the most natural nourishment in the world for us. It determines our entire existence: Light affects important hormonal and metabolic processes, synchronizing our internal clocks again and again. Light gives our lives rhythm. Whenever there is a lack of natural daylight our rhythm is disrupted. The Visual Timing Light (VTL) system from Derungs recreates the effects of natural daylight, restoring proper rhythm and balance to people's lives.

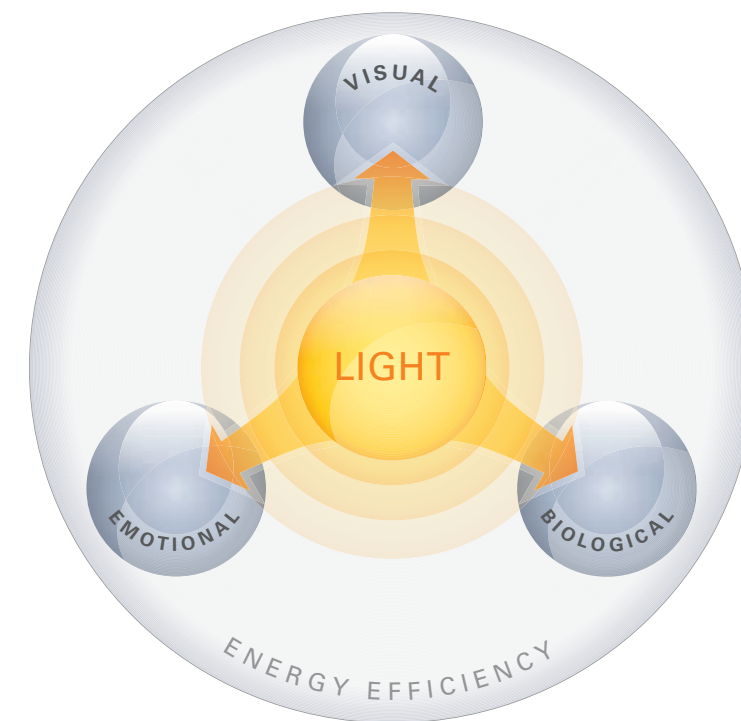


MARVEL OF NATURE

THE THIRD DIMENSION OF LIGHT

It is well known that the benefits of light go beyond just helping us see and creating a pleasant atmosphere within a space. Now, scientific research has shown that natural light also positively affects our biological health and well-being. These findings have created the third biological dimension of light. For people that are confined to the indoors most of the time, such as the elderly and physically impaired, the lack of daylight can have far-reaching implications. Insufficient natural daylight has a profound negative affect on people's lives. Derungs has set out to improve the well-being of these people and assist in improving their overall quality of life.

THE DIMENSIONS OF LIGHT



Visual: The visual dimension makes it possible to see, to perceive our environment and cope with cognitive tasks.

Emotional: The interplay of light and color triggers moods and is therefore particularly important in the interior design field.

Biological: Light has a special effect on the circadian rhythm of humans and affects our health and well-being.

Energy efficiency: Light should only be supplemented or influenced where and when it is necessary, for example if there is a lack of sufficient natural light in a room.

FASCINATION OF LIGHT AND PEOPLE

THE INTERNAL CLOCK

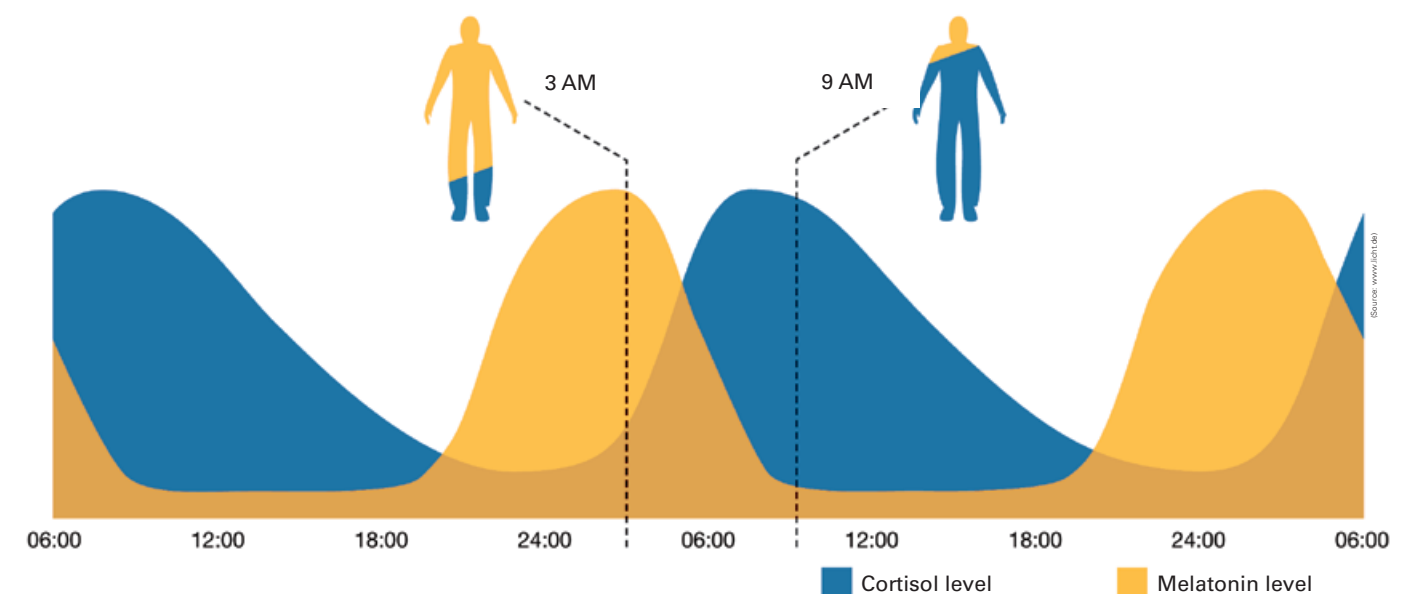
Light controls a variety of internal clocks that regulate our day/night cycle and influence critical neurological and metabolic processes. Although our biological clocks are genetically preset to compensate for the 24-hour cycle, it must be re-synchronized daily through exposure to daylight or artificial light designed to replicate daylight. Hormone levels of Melatonin, Cortisol and Serotonin, all crucial elements in keeping our systems in balance, are greatly impacted by this process. If exposure to daylight is missing, sleep disorders, chronic fatigue and/or depression may soon follow.

THE HORMONAL PULSE GENERATORS

The third photoreceptor in the retina sends signals to the brain and regulates hormone production. The three most important hormones that control the biological rhythm are:

- **Melatonin** makes you tired, slows the body functions and lowers activity in favor of earned rest.
- **Cortisol** on the other hand is a stress hormone that is produced from about 3 o'clock in the morning. It stimulates the metabolism and programs the body for day mode.
- **Serotonin** works as a stimulant and motivates. While the cortisol levels in the blood drop throughout the day and thereby act counter-cyclic to the melatonin level, serotonin helps elevate energy levels - a 24/7 cycle.

THE EFFECT OF DAYLIGHT ON HUMANS

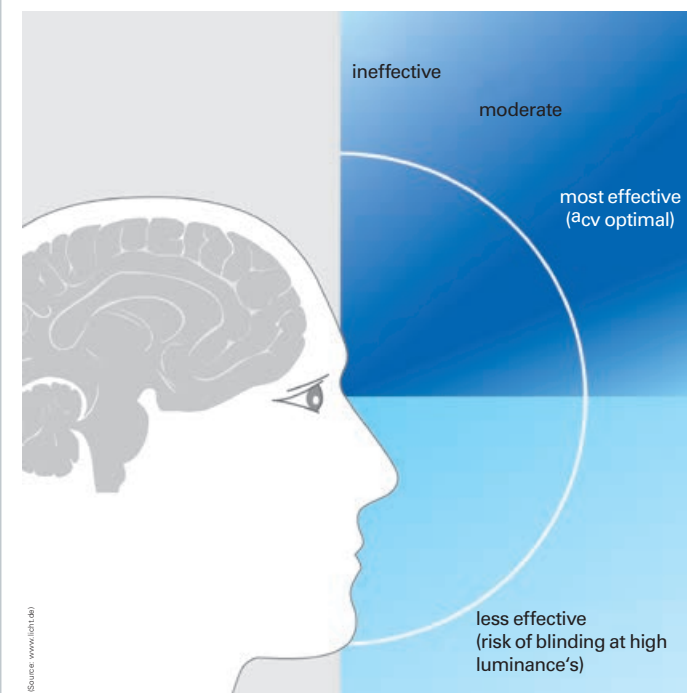




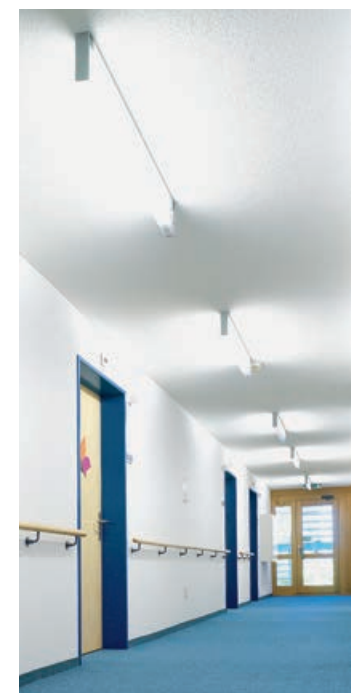
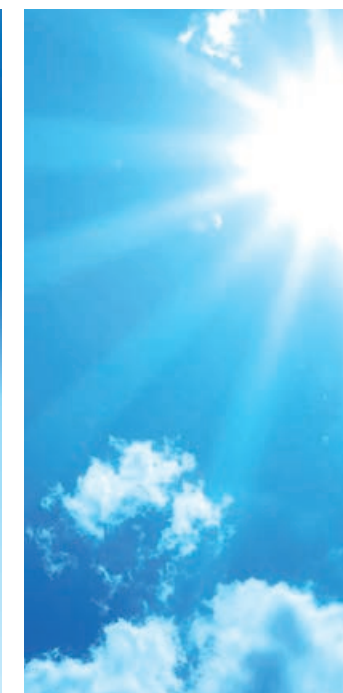
BIOLOGICALLY EFFECTIVE LIGHT TAKING CUES FROM NATURE

When trying to mimic the effects of natural light to balance people's circadian rhythms, the lighting system should follow similar parameters to nature. As in nature, the main illumination should originate from a large source area light. The combination of direct and indirect light sources produces an "artificial sky light". Ideally, the wall and ceiling light blend smoothly, giving the environment a soft, natural feel.

ANGLE BLUE EFFECT



Light that meets the eye from the front and from above is the most effective biologically. The receptors for cold tone light are located in the lower area of the eye.

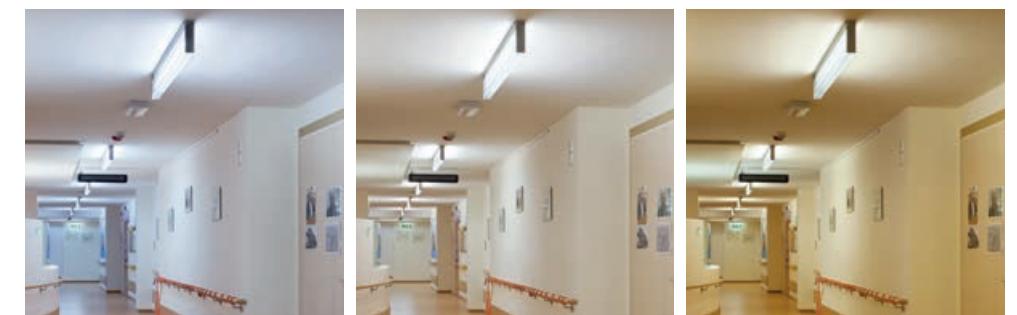
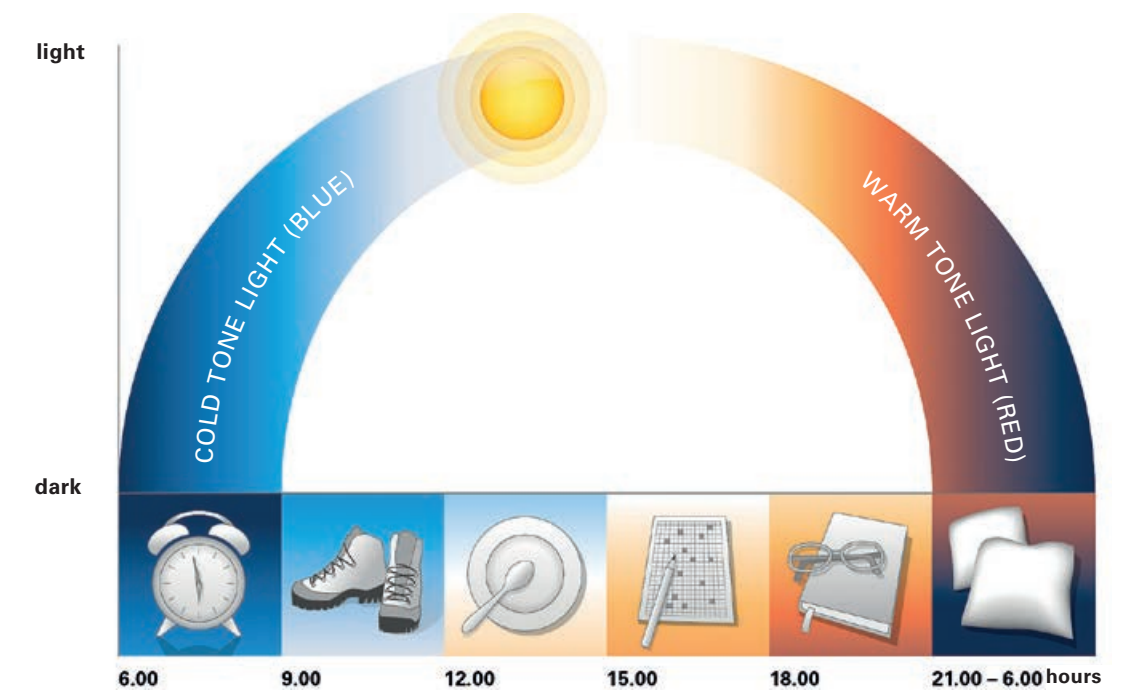


The proper wavelength of the light is also important. It is biologically most effective at a wavelength between 460 and 480 nanometers.

VISUAL TIMING LIGHT SEEING THE LIGHT OF DAY

Digital Technology has changed our lives. By simulating the environment's 24-hour light cycle, the Visual Timing Lighting system by Derungs, replicates natural daylight and provides residents visual comfort by regulating their natural circadian rhythms. Various lighting scenarios can be defined via sophisticated, digital lighting controls. Each scenario can be customized by having a special adjustment of light color and intensity to provide the most pleasant lighting.

NON-TRANSITIONAL VISUAL TIMING LIGHT



The cold tone light activates and stimulates while the warm tone light relaxes and supports rest periods.

BETTER LIGHTING FOR THE ELDERLY SENIORS IN FOCUS

Elderly people and dementia patients are often burdened by age-related vision loss as well as difficulties with balance and perception. Considering the impairment of function that these conditions create, it is clear that good lighting is essential for independent living and safety. Poor visual and perceptual ability can best be compensated for by sophisticated lighting technology and a professional lighting concept.

MORE LIGHT FOR MORE QUALITY OF LIFE

Light requirement

The aging eye needs more light intensity than with the younger eye.

Preventing accidents

Light is an essential aspect in terms of safety. It allows us unrestricted mobility and possibly unlimited performance.

Uncertainty and anxiety

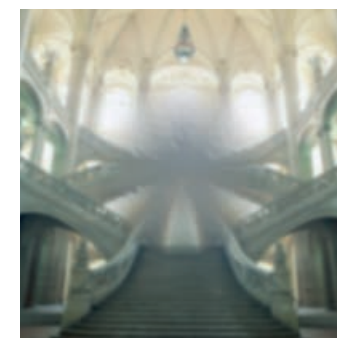
Overtaking shadows or reflections are often the cause of confusion and uncertainty. Low shadow and glare-free light has a positive effect on the perception of space.

Staying active

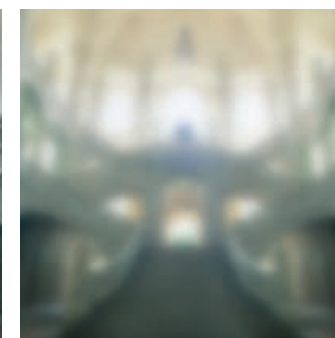
The active participation in life should always be promoted, such as mobility, management of cognitive tasks, reading and crafts.



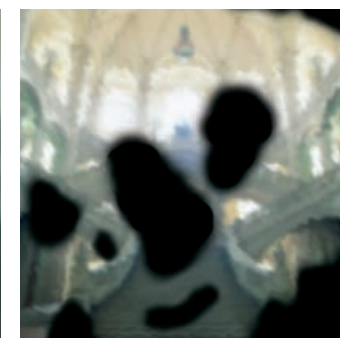
EYE CONDITIONS



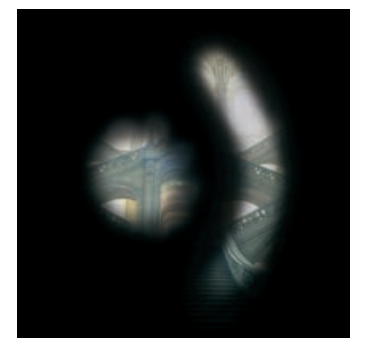
Macular degeneration



Cataract



Diabetic retinopathy



Glaucoma

DEMENTIA

ONE OF THE GREATEST CHALLENGES

According to studies, one out of every two people will require significant nursing care at some point in their lifetime. The diagnosis of Dementia is particularly challenging for patients, caregivers and family members alike. This trend is increasing as our population ages. A state of disorientation, anxiety, stress and relocation to a nursing facility are typical for people diagnosed with this condition. They are often in a perpetual fog which is reinforced by insufficient light and poor vision. Both pathological and biological disorders including sleep disorders are common. These symptoms can reach the level of full day-night reversal of sleep patterns adding to the patients' discomfort. The Visual Timing Light system provides gentle and effective support for maintaining a proper circadian rhythm.

EVALUATION

Improved sleep quality thanks to the VTL lighting

A study was done in Hufingen, Germany, to examine the health and welfare of nursing home residents before and after the use of the Visual Time Light system.

They found that the residents' sleep quality improved after only eight weeks, with almost 75% fewer restless nights observed after a year's time.

When the **VTL lighting** was switched off within the scope of the test, sleep behaviors deteriorated to their original levels after six weeks. By putting the **VTL lighting** back into effect, the sleep behaviors improved again.



ADVANTAGES FOR RESIDENTS AS IF THE SUN IS SHINING

Independent studies show a direct link between daylight and well-being. We now know that biodynamic light has a positive impact on emotional and physical well-being. Morning light invigorates the mind and promotes activity. From the middle of the day, warm tone light supports the body and prepares it for the night. The day-night rhythm is sustainably stabilized. In some cases, gerontologists even see opportunities to reduce dosages of sleep medications.

BENEFITS AT A GLANCE

A lack of daylight

is compensated for and can prevent the development of mood fluctuations and even depression.

Stabilization of the circadian rhythm

by the daylight dependent changes in light intensity and light color. Especially people with dementia can be helped by this.

Activation and promotion of rest periods

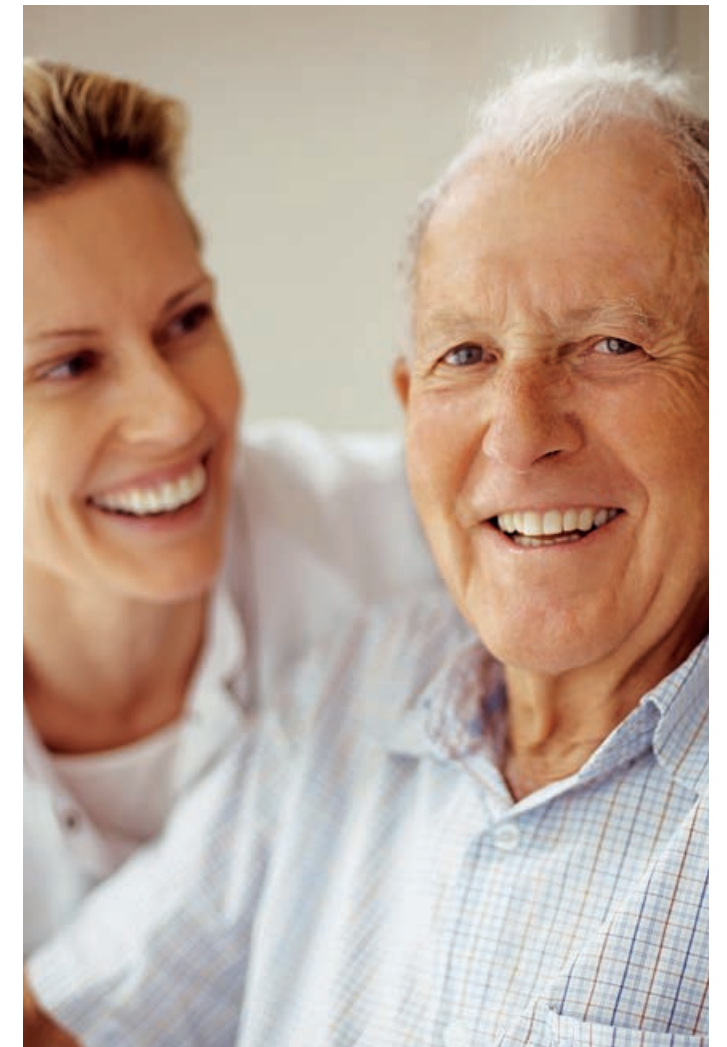
by restoring the circadian rhythm.

Improved well-being

the emotional and physical well-being improves as a result of restful nights.

The administration of sleep-inducing drugs

could even be reduced in some cases.



ADVANTAGES FOR CAREGIVERS

GOOD LIGHT RELIEVES THE CAREGIVERS

Employees report that proper lighting enhances the work environment and results in less eye strain and fatigue. If residents feel more relaxed, more comfortable in their surroundings and participate more in daily activities, it improves the effectiveness of caregivers' efforts. At the same time, VTL helps in creating a common routine for the day. It provides visual cues for meal times and recreation. Especially in people with dementia, VTL helps to stabilize the sleep-wake cycle. In short: The nursing staff also benefits from biodynamic light.

BENEFITS AT A GLANCE

Lack of daylight

or even false light at the wrong time of day is balanced and counteracts insomnia.

Improved well-being

by biodynamic light that supports the internal clock of the employees.

Freeing personnel

through animated activity and resting phases at the right time and basically balanced residents.

Relaxed into the evening

with fewer headaches and less tired eyes, which are often a result of poor lighting.

Motivation of staff

by knowing that the seniors are given individualized care and are as comfortable and relaxed as possible.



BENEFITS FOR OPERATORS AND HOME MANAGERS HOLISTIC CARE

When comprehensively planning the lighting needs of the elderly, it is important to consider the needs of the staff as well. Proper lighting has significant impact on health and well-being, and helps to provide the best possible quality of life for seniors. The higher investments succeed: The very high light yield of VTL lights D^{lite} **Amadea** and **Vanera** requires fewer lights than other conventional lighting systems. In addition, the sophisticated light management system helps save on costs and energy.

BENEFITS FOR OPERATORS AT A GLANCE

Perceived immense additional value

due to interior design measures, particularly in the context of renovation projects.

Measurable added value

by reducing absenteeism and lost days of staff, increasing commitment and motivation of staff.

Economically efficient

thanks to intelligent lighting management and economical bulbs.

Clear signal effect

in relation to the comprehensive, holistic care of the residents.

Growing reputation

of the facility through the use of need-based lighting systems for the elderly, especially dementia sufferers.



THE LIGHT MANAGEMENT SYSTEM VTL ALMOST AS INTELLIGENT AS NATURE ITSELF

Easy, convenient and biologically effective is how the VTL lighting management system from Derungs is designed for today's modern senior care environments. The lighting is adjusted automatically to residents' routine by utilizing current research and technology. The focus is on having engaged residents while insuring their health and safety. VTL is particularly suitable for corridors, waiting areas, and nursing oases, but also in other areas where there is a lack of natural light.



THE VTL-COMPONENTS.

FEW STEPS FOR BIODYNAMIC LIGHTING.

Vanera VTL – Visual Timing Light



The modern classic.
The Vanera, with its timeless, simple silhouette, fits perfectly into any room and illuminates every room uniformly.



Amadea VTL – Visual Timing Light



The cozy area light.
Not only does it have a special charm, but is also distinguished by excellent lighting efficiency. It illuminates every room uniformly just like the Vanera.



DALI control system



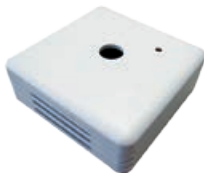
The heart of lighting control.
Up to 128 DALI addresses can be integrated into the DALI controller via two ports.

Operation using the iPad or controller



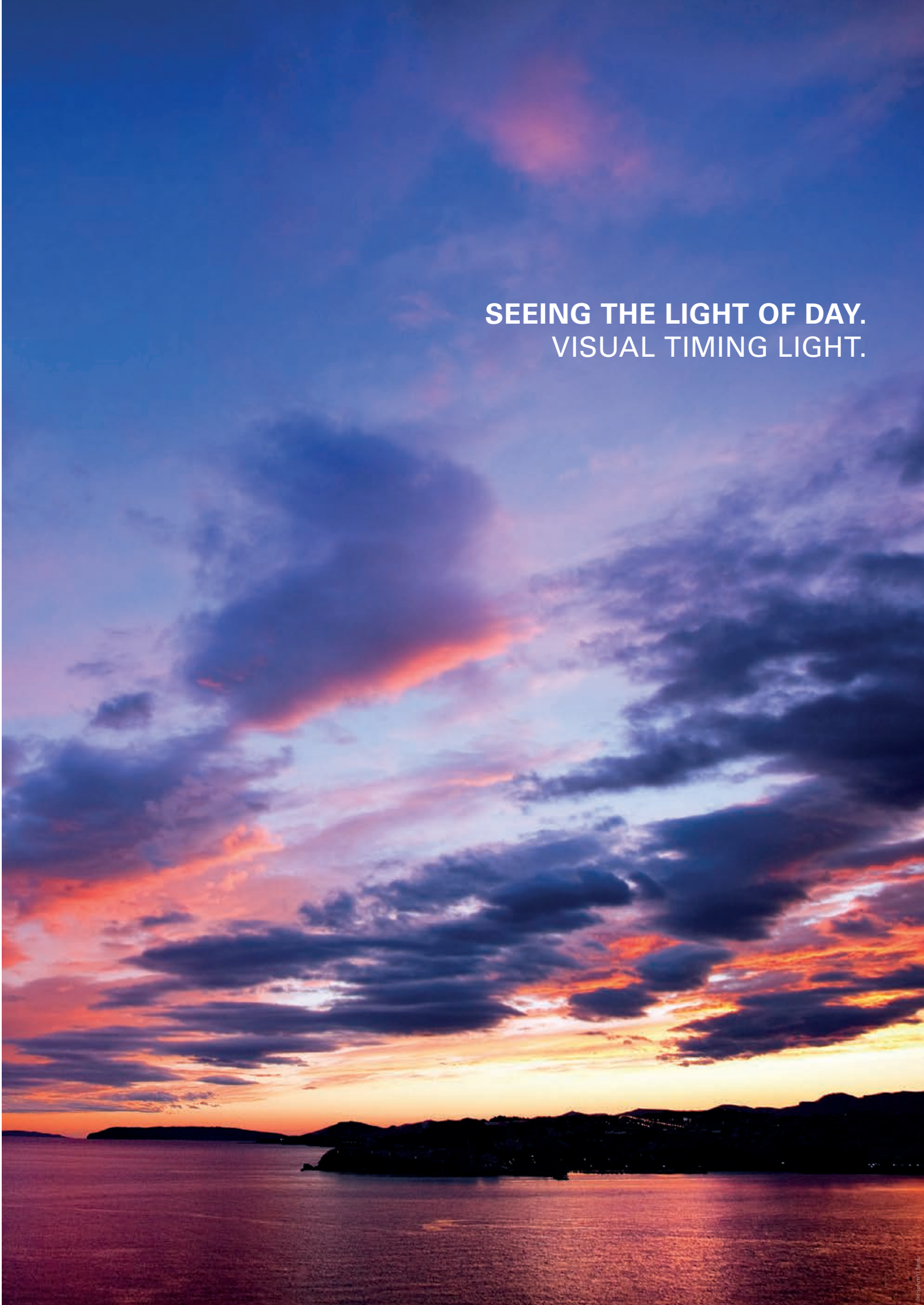
The modern control option.
It is possible to operate the lighting controller via the app on the iPad. Lighting scenes and individual lighting effects can thereby be easily activated. Programming is accomplished via a laptop or PC.

Daylight sensor and motion detector



The economical accessories.
The VTL system is extremely versatile. Additional system components, such as the daylight sensor also optimize their capabilities.

SEEING THE LIGHT OF DAY.
VISUAL TIMING LIGHT.



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