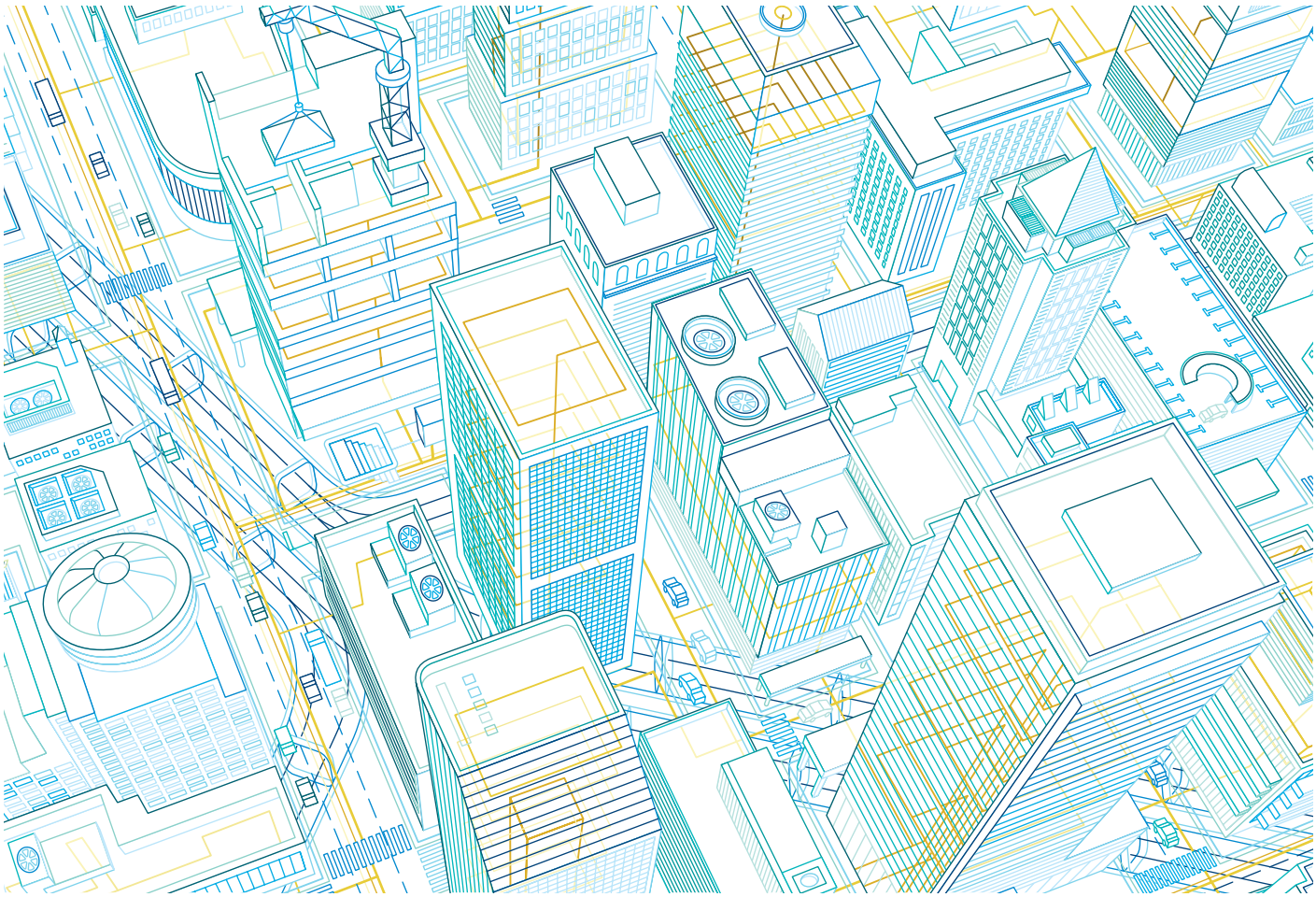
ABB solutions to manage the lighting circuits, according to a precise value of ambient light.

Power and productivity
for a better world™

T Line twilight switches and TWA astronomical twilight switches
Saving and efficient use of energy for public lighting.



To control the automatic activation of a lighting circuit to variations in natural light, an environment, and thus to ensure an efficient use of energy, ABB offers a full range of performance and twilight switches predisposed to solve the most common to more complex application situations in the control of lighting circuits.

The constant investment to research and development, make ABB a point of reference in the production of cutting-edge products that fully reflect the installation requirements of even the most demanding customer. ABB's goal is to provide the market with innovative products in terms of design, energy saving, safety, functionality and environmental impact. The high performance, highest reliability, quiet operation and a compact design, are among the main characteristics that distinguish "T Line" twilight switches and "TWA" astronomical twilight switches.

T Line twilight switches command lighting circuits according to the scheduled level of the ambient light detected by a dedicated sensor. Since they are energy-efficient, they are particularly useful in public places (garden, parking lots, entrances, courtyards, etc…).

T Line twilight switches range allow to switch ON and switch OFF lighting devices according to a scheduled level of the ambient light. They are used in combination with a sensor to detect if the ambient light is higher or lower than the set level. A switching delay prevents them from operating unnecessarily when the light intensity suddenly changes (e.g. lighting, moving vehicles, etc..).

The control automated of lighting provides more than 15% of energy savings

The basic version T1 in one channel, is preset a 10 lux from factory and is equipped with 2 signaling LEDs that indicate the set point value and display the status of the contact. The operating instructions are printed on the side of the product. The advanced version T1 PLUS, switches feature a setpoint that can be adjusted for 4 different scale values:

The advanced version T1 PLUS, switches feature a setpoint that can be adjusted for 4 different scale values:
- 2…40 Lux
- 20…200 Lux
- 200…2000 Lux
- 2000…15000 Lux

This make them ideal for daytime applications where the lux values to detect is very high. T1 PLUS allows also the possibility to adjust the relay tripping in a time ranging from 15-90 sec. for switching ON and 20-120 sec. for switching OFF. They are equipped with 2 signaling LEDs that indicate the setpoint value and display the status of the contact.

The TWP version is designed for installation on the pole / wall, with photocell inputs and integrated cabling including cable gland seals to ensure a high protection degree. Thanks also to the high quality, TWP provides excellent resistance to atmospheric agents and a long service life. TWP is also equipped internally with a preset sensor of 10 Lux. TWP is the ideal solution to management the external light systems such as the public ones, more precisely, in cases where there is a need of having to control the lighting of public or private roads, gardens, courtyards to the decline of solar radiation during precisely the twilight.

High performance and long-term reliability

The twilight astronomical switches TWA-1 and TWA-2, respectively, in 1 and 2 channels, they automatically control lighting circuits depending on the time of sunrise and sunset, greatly increasing energy efficiency.

The programming is in fact based on a mathematical algorithm able to calculate the time of the rising and setting of the sun in a certain location for each day of the year. Once powered the device, simply insert date, time, geographical coordinates and time zone because it is ready to work. The installation of these devices is particularly useful when using a twilight switch with external probe is not recommended because it may be subject to malfunctions caused by air pollution, excessive brightness or vandalism. TWA-1 and TWA-2 are also indicated for the control of public lighting, shop windows of shops, neon signs, monuments, facades and illuminated fountains.

The twilight astronomical switches TWA-1 and TWA-2, can be programmed directly on your PC using the software Handytimer. Once created, the program can be transferred to the programming key and copied into multiple devices, avoiding any errors in reprogramming.

More than 30% of energy saving, thanks to the automatic shut-off lighting when not needed.

Minimal configuration:
– Operating system Microsoft Window 95, 98, 2000, NT, Millennium, XP
– Memory 15 Mb of free hard disk space

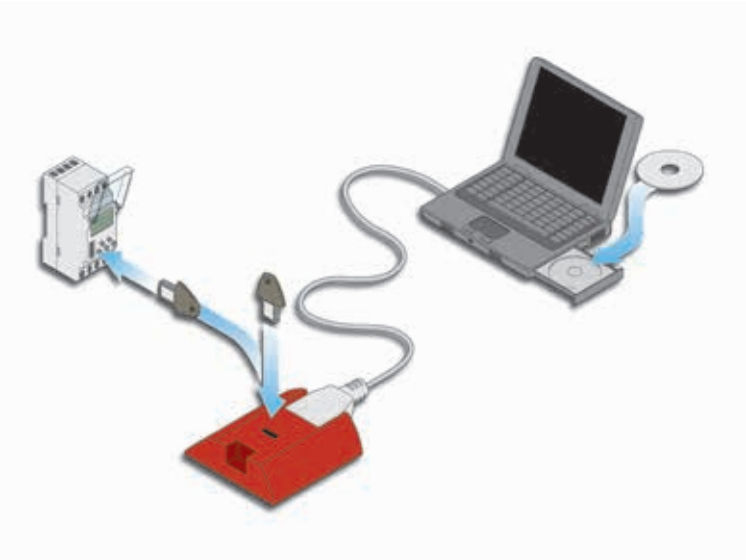
1a - Connect the USB cable to the programming interface device and to your PC
1b - Insert CD, install the HANDYTIMER software with easy step by step instruction
1c - Create the required program
2a - Insert the DT-VK memory key into the programming interface device
2b - Copy the program on the DT-VK memory key
3 - Insert the DT-VK memory key into TWA-1 or TWA-2 to save the program

Applications
– program creation (standard or non-standard)
– program reading and writing on electronic keys

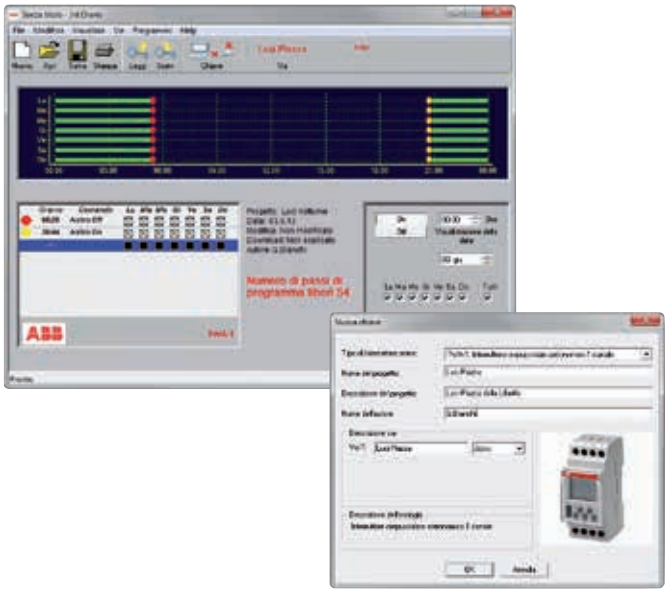
Advantages for the user
– option to save a copy of the program on an electronic key
– option to save a number of non-standard programs on different keys
– easy management of non-standard programs (simply insert and remove the key containing the non-standard program)

Functions
– creation and editing of programs on PC with user-friendly display graphics
– program saving
– graphic printouts of programs, reading and transfer of programs between PC and electronic keys

Advantages for the installer
– management of the client‘s programs from the office
– traceability of written programs
– customer service (programming can be copied to an electronic key and sent by courier to the plant for rapid installation and use)
– option to modify the created programs directly on the installed products
– time-saving for repetitive installations. The program is written once only and then copied to a number of astronomical twilight switches



Easy-to-read programming display: day of the week, duration of the ON or OFF periods, number of steps available, ...



Programming access page

Main advantages

DIN rail version

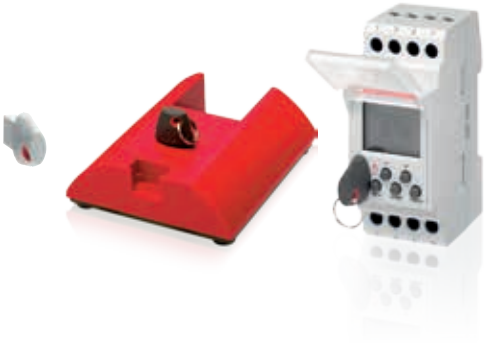
– Adjustment range from 2 to 200 Lux
– 2 indicator Leds: one for the contact status and the other for the threshold set value
– External sensor pre-set at 10 Lux
– Switching Delay
– Protection degree of IP65
– Wiring diagram lasered on the side of the product
– 1 module width
– Captive clamps screws
– Complies to RoHS directives

in addition to the PLUS version

– Adjustment range from 2 to 15,000 Lux
– Four different scales value for a more precise brightness regulation value
– Adjustable switching delay

Pole/wall version

– Adjustment range from 2 to 200 Lux
– Removable base for easy maintenance
– Sensor pre-set at 10 Lux
– Switching delay
– Protection degree of IP65
– Wiring and operational diagram laserated on the back of the product
– Captive clamps screws
– Complies to RoHS directives



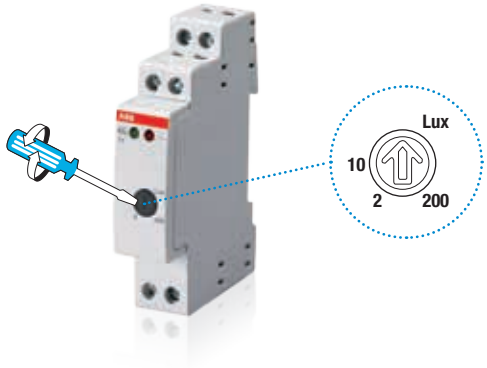
Astronomical version

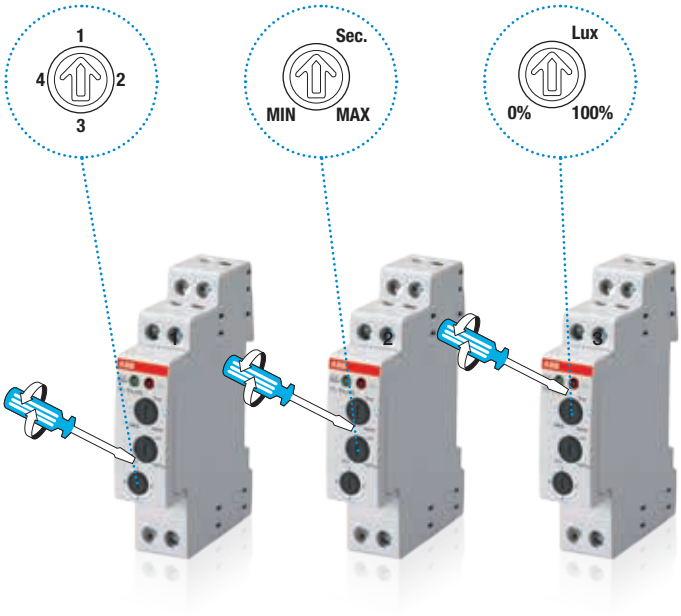
– Astronomical and time programming
– 1 or 2 changeover contacts
– Possibility to create time programming during the period from sunset to sunrise
– Manual and permanent override, activated with one touch on the front of the device
– PC software for quick and easy programming
– Memory key for improved program management
– Clear display visualizations of contacts status
– Automatic summer and winter time change
– Unlosable hinged window
– Holiday program
– Keypad security lock with PIN code to prevent interference by unauthorised persons
– 56 stored memory locations
– Opportunity to correct the astronomical time up to ±120 min
– latitude adjustment range from +90° North to -90° South.
– longitude adjustment range from 180° East to 180° West.
– Wiring diagram printed on the side of the product
– Complies to RoHS directives

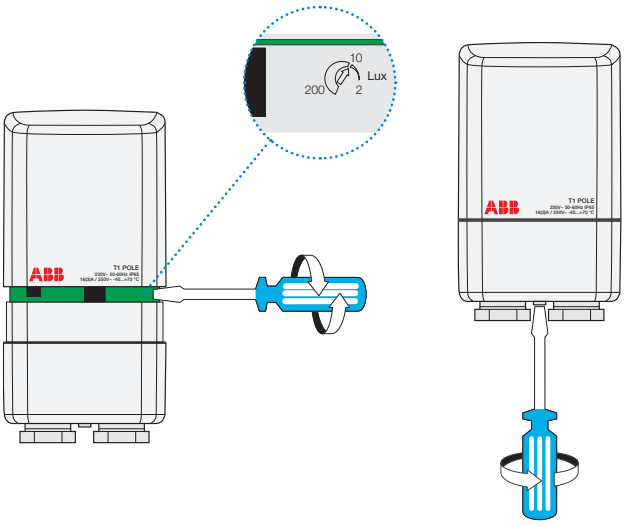
Technical characteristics

		T1	T1 PLUS	TWA-1	TWA-2	T1 POLE
Rated supply voltage	V	110 ÷ 230 AC	110 ÷ 230 AC	230 ± 15% AC	230 ± 15% AC	110 ÷ 230 AC
Contact type		1NO	1NO	1NO/NC	2NO/NC	1NO polarized
Switching capacity						
- resistive load cosφ 1	A	16	16	16	16	16
- inductive load cosφ 0,6	A	3	3	10	10	3
- incandescent lamps	cosφ 1	max 3600 W	max 3600 W	–	–	max 3600 W
- fluorescent lamps	cosφ 0,8	max 3600 W	max 3600 W	–	–	max 3600 W
- fluorescent - duo./electronic lamps	cosφ 0,9	max 300 W	max 300 W	–	–	max 300 W
Rated frequency	Hz	50-60	50-60	50-60	50-60	50-60
Switching delay						
- ON	s	30 ±10%	reg. 15…90 ±10%	±120 min on astronomical intervention	±120 min on astronomical intervention	30 ±10%
- OFF	s	40 ±10%	reg. 20…120 ±10%	±120 min on astronomical intervention	±120 min on astronomical intervention	40 ±10%
Brightness range (with tollerance of ±20%)	Lux	2…200	2…40	–	–	2…200
			20…200			
			200…2000			
			2000…15000			
Time reference		–	–	quartz	quartz	–
Minimum switching time	min.	–	–	1	1	–
Max. operations per cycle		–	–	56	56	–
Running reserve	years	–	–	5	5	–
Operating accuracy		–	–	± 1,5 sec/24h	± 1,5 sec/24h	–
Astronomical time precision	min.	–	–	± 10	± 10	–
Protection degree						
- twilight switch		IP20	IP20	IP20	IP20	IP65
- Sensor		IP65	IP65	–	–	IP65
Operating temperature						
- twilight switch	°C	-25...+55	-25...+55	-10...+55	-10...+55	-40...+70
- Sensor	°C	-40...+70	-40...+70	–	–	-40...+70
Storage temperature						
- twilight switch	°C	-40...+70	-40...+70	-20...+60	-20...+60	-50...+80
- Sensor	°C	-50...+80	-50...+80	–	–	-50...+80
Power consumption	VA	4,5	4,5	6	6	4,5
Max. commutable power	W	3500	3500	4000	4000	3500
Terminal size for cable	mm²	2,5	2,5	1...6	1...6	2,5
Terminals		loss-proof screw	loss-proof screw	loss-proof screw	loss-proof screw	loss-proof screw
Tightening torque: terminals	Nm	0,5	0,5	1,2	1,2	–
screw sensor	Nm	0,4	0,4	–	–	0,4
Mounting		on DIN rail	on DIN rail	on DIN rail	on DIN rail	pole / wall
Switching status indication/brightness range		red led / green led	red led / green led	display LCD	display LCD	–
Max wiring length	m	100	100	–	–	–
Modules	n°	1	1	2	2	–
Reference standards		EN 60669-1; EN 60669-2-1; EN 60730-1	EN 60669-1; EN 60669-2-1; EN 60730-1	EN 60730-1; EN 60730-2-7	EN 60730-1; EN 60730-2-7	EN 60669-1; EN 60669-2-1; EN 60730-1

Operating principle





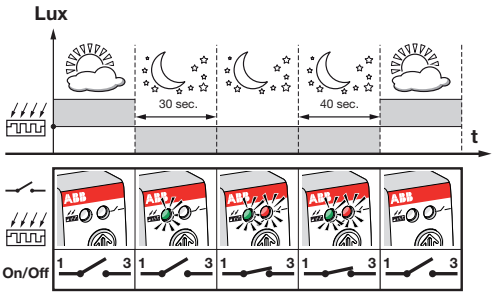


Regolazione della soglia

Schema di montaggio

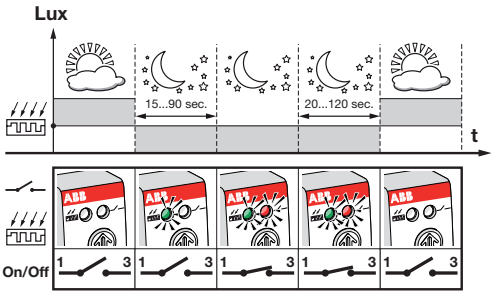
T1

Set the desired activation threshold (from 2 to 200 lux), using the lux control knob. N.B.: the position corresponding (with approximation) to the 10 lux activation threshold is marked on the front of the item. If the GREEN LED is illuminated, this indicates the activation status of the threshold.
If the RED LED is illuminated, this indicates that the relay contact is closed (illumination lit up).



T1 PLUS

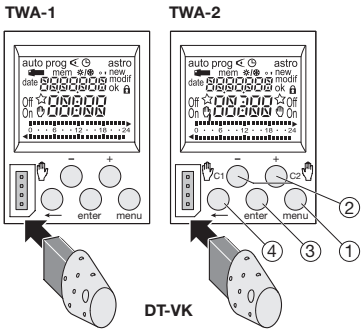
1) Set the desired lux scale (2-40; 20-200; 200-2.000; 2.000-15.000), using the lux scale control knob. N.B.: the position corresponding (with approximation) to the 10 lux activation threshold is marked on the front of the item. If the GREEN LED is illuminated, this indicates the activation status of the threshold. If the RED LED is illuminated, this indicates that the relay contact is closed (illumination lit up).
2) Set the desired lux percentage (0%->100%), using the lux percentage control knob.
3) Set the switching delay (MIn -> MAX), using the switching delay control knob.



T1 POLE

1) Switch on the power supply
2) Make the threshold adjustment (from 2 to 200 lux) by turning the trimmer. The lighting of the red LED represents the achievement of the threshold set (contact closed) after having spent a period of approximately 30 seconds. since the last adjustment.
3) Secure the dome by lightening the captive screw inserted through the bottom of the base. Tighten the screw until the dome pressed on the gasket sufficiently to ensure a hermetic seal.

TWA-1 and TWA-2



Keys

① **menu** : selection of operating mode.
auto : mode of running according to the program selected.
prog : **new** for programming mode.
prog : **modif** to modify an existing program.
: checking of the program.
: modification of time, date and selection of the winter/summer timechange mode ☼/❄
astro : astronomical mode.
☆ : indicates that the channel is in astronomical mode.

② **+** and **-** : navigation or setting of values.
+ - (TWA-1)
C1 , C2 (TWA-2): in **auto** mode, selection of overrides, or waivers.

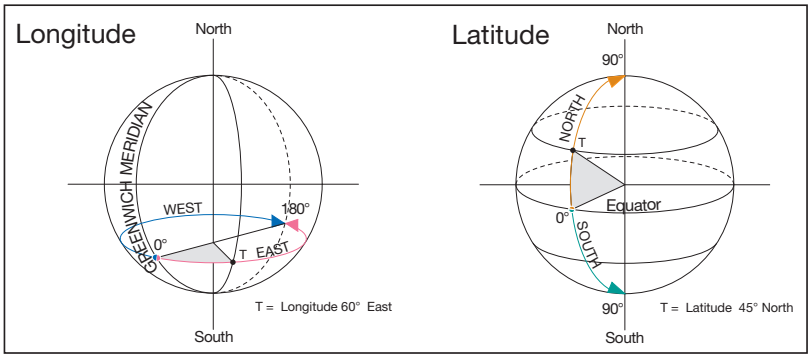
③ **enter** : to validate flashing information on display.

④ ← : to return to the previous step.

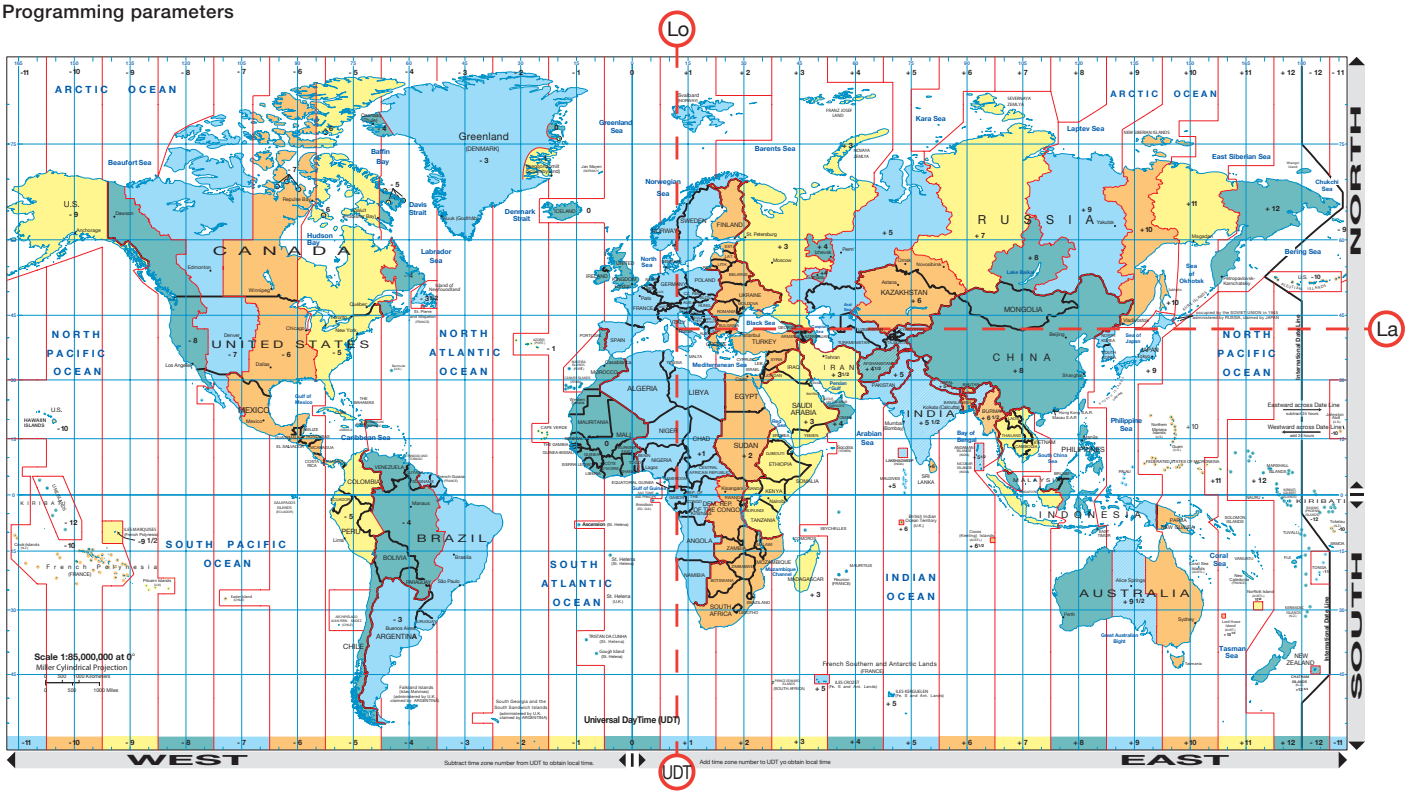
Programming example

Es: ROMA

Lo Longitude 12° EAST
La Latitude 41° NORTH
UDT +1 Universal Date Time = +1 hour



Programming parameters



Twilight switches T1

Operating principle

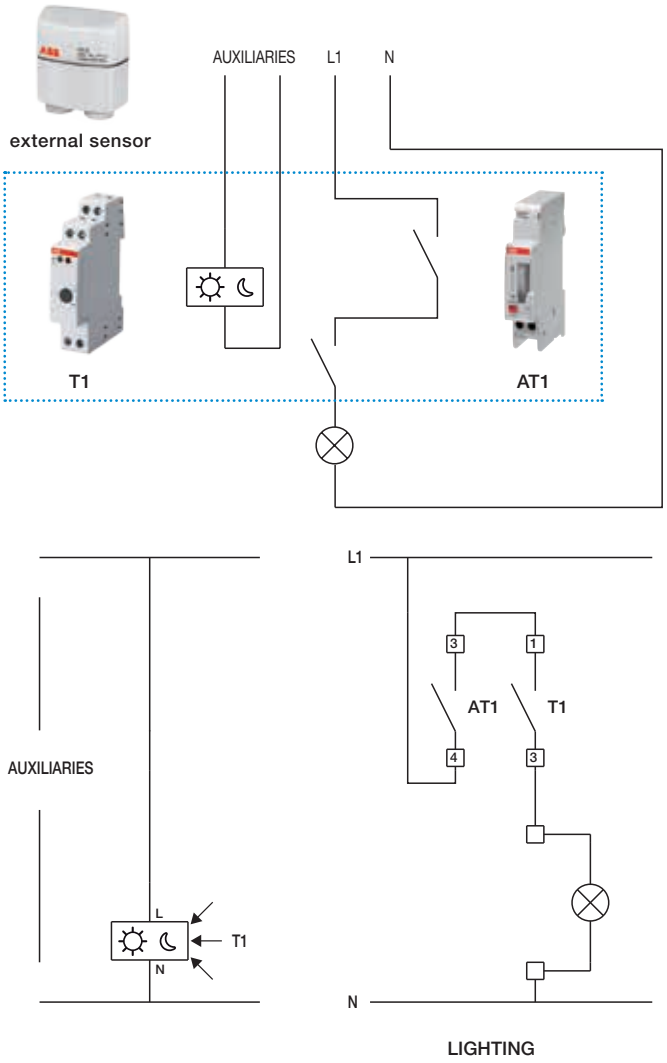
The diagram shows an example of the installation of the T1 twilight switch in the lighting system of a commercial establishment. When the external light falls below a certain level (e.g. during the evening when the shop is closed), the device switches on the window lights and the shop sign. The lights can be switched off late evening to reduce power consumption thanks to the AT1 switch timer.

Installation example

As shown in the diagrams, one of the possible applications is the installation of a T1 twilight switch in the lighting system of a commercial establishment. When the external light falls below a certain level (e.g. when the shop is closed), the twilight switch switches on the window lights and the sign. The lights can be switched off late evening to reduce power consumption thanks to the AT1 switch timer which keeps the circuit open until the next morning. When the external light returns to above the threshold value, the twilight switch relay returns to the open position.

Application environments

The installation of the T1 twilight switch with an AT electromechanical timer is particularly useful in settings and situations where energy saving is a prime concern (shops, office corridors and public passageways, car parks, parks, etc.).

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Twilight switches T1 PLUS

Operating principle

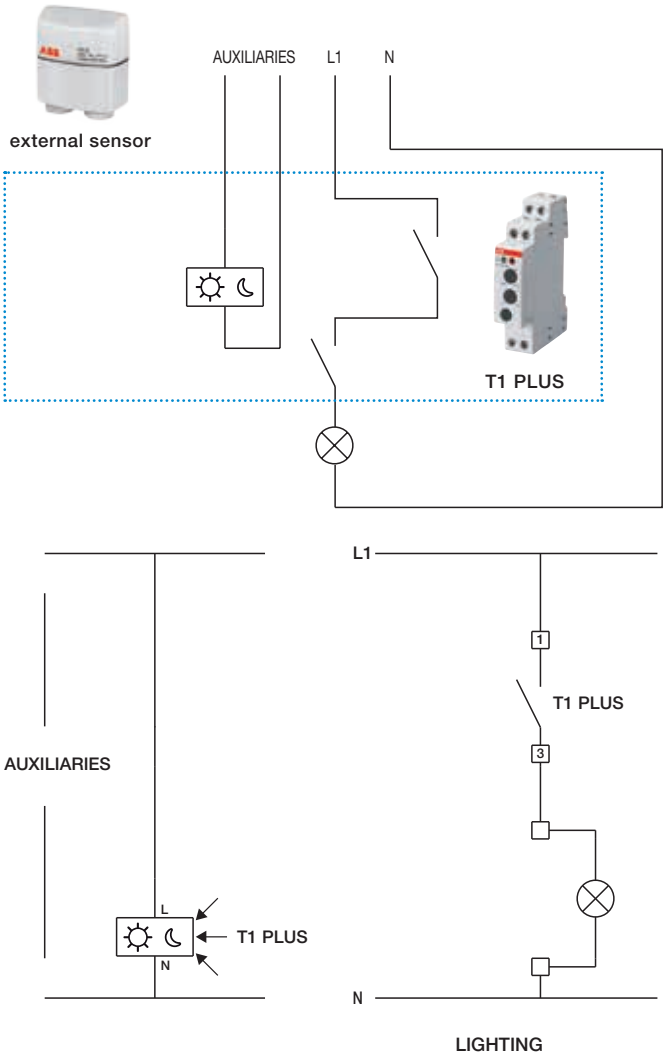
The diagram shows an example of the installation of the T1 PLUS twilight switch in the lighting system of a greenhouse. When the external light exceeds a certain level (e.g. during the warmest hours of the day, i.e. early afternoon), the device activates the shading system, e.g. roller blinds. Thanks to the option to advance or delay the activation-deactivation time, the T1 PLUS can also maintain the roller blinds closed in the case of passing clouds.

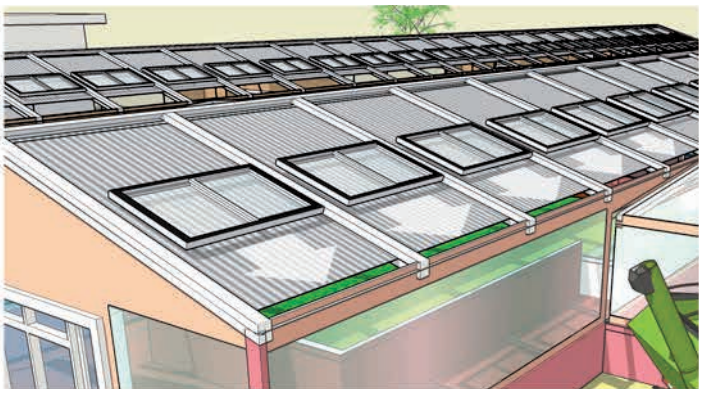
Installation example

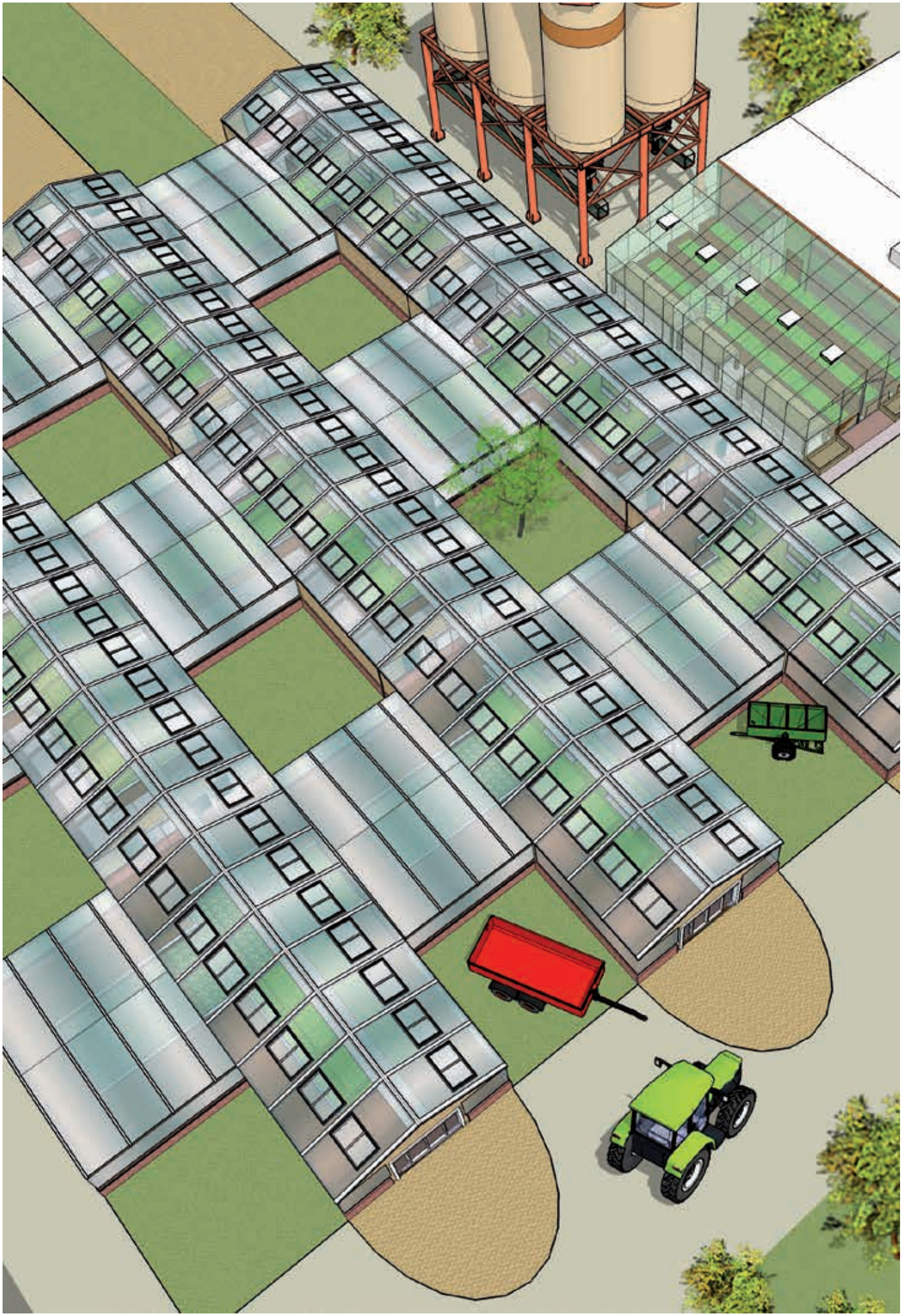
As shown in the diagrams, one of the possible options is to install a T1 PLUS twilight switch in the lighting system of a greenhouse. When the external light exceeds a certain level (for example during peak hours in the early afternoon) the twilight switch activates the roller blinds, protecting the plants in the greenhouse against burning by the strong sunlight. When the external light returns to below the threshold value, the twilight switch relay opens the blinds to allow the sunlight to pass through.

Application environments

The installation of the T1 PLUS twilight switch is particularly useful in settings and situations where lighting control is required for locations where there are consistently high brightness values, thus guaranteeing substantial savings in energy consumption (greenhouses, arcades, photovoltaic plants, etc.).







Twilight switches T1 POLE

Operating principle

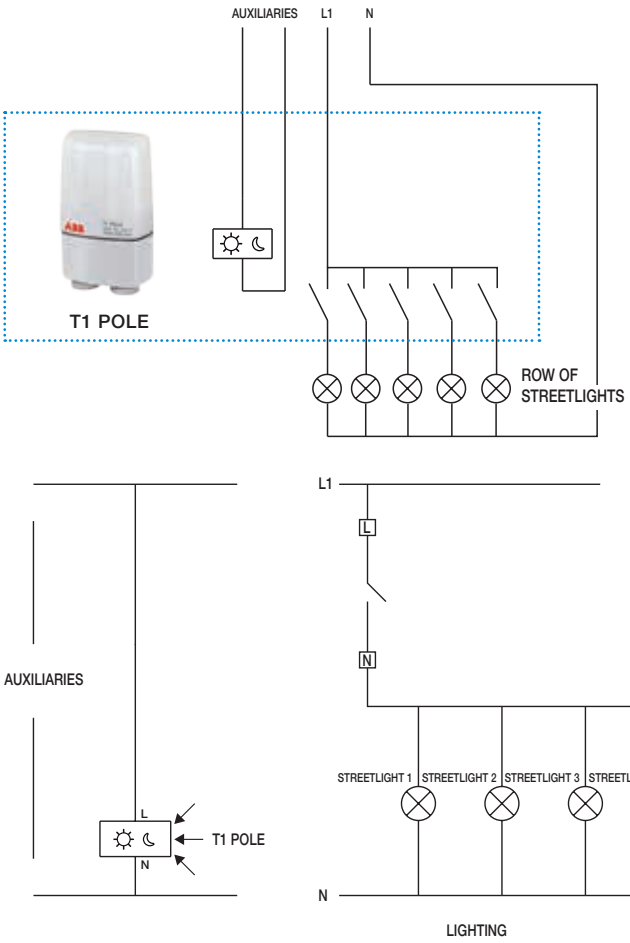
The diagram shows an example of the installation of the pole mounted T1 POLE twilight switch for motorway lighting systems.
When the external light falls below a certain level, 10 lux for example, the device switches on the lights present in tunnels, service areas, near to junctions, etc. The lights are then switched off by the T1 POLE in the morning when the 10 lux value is exceeded.

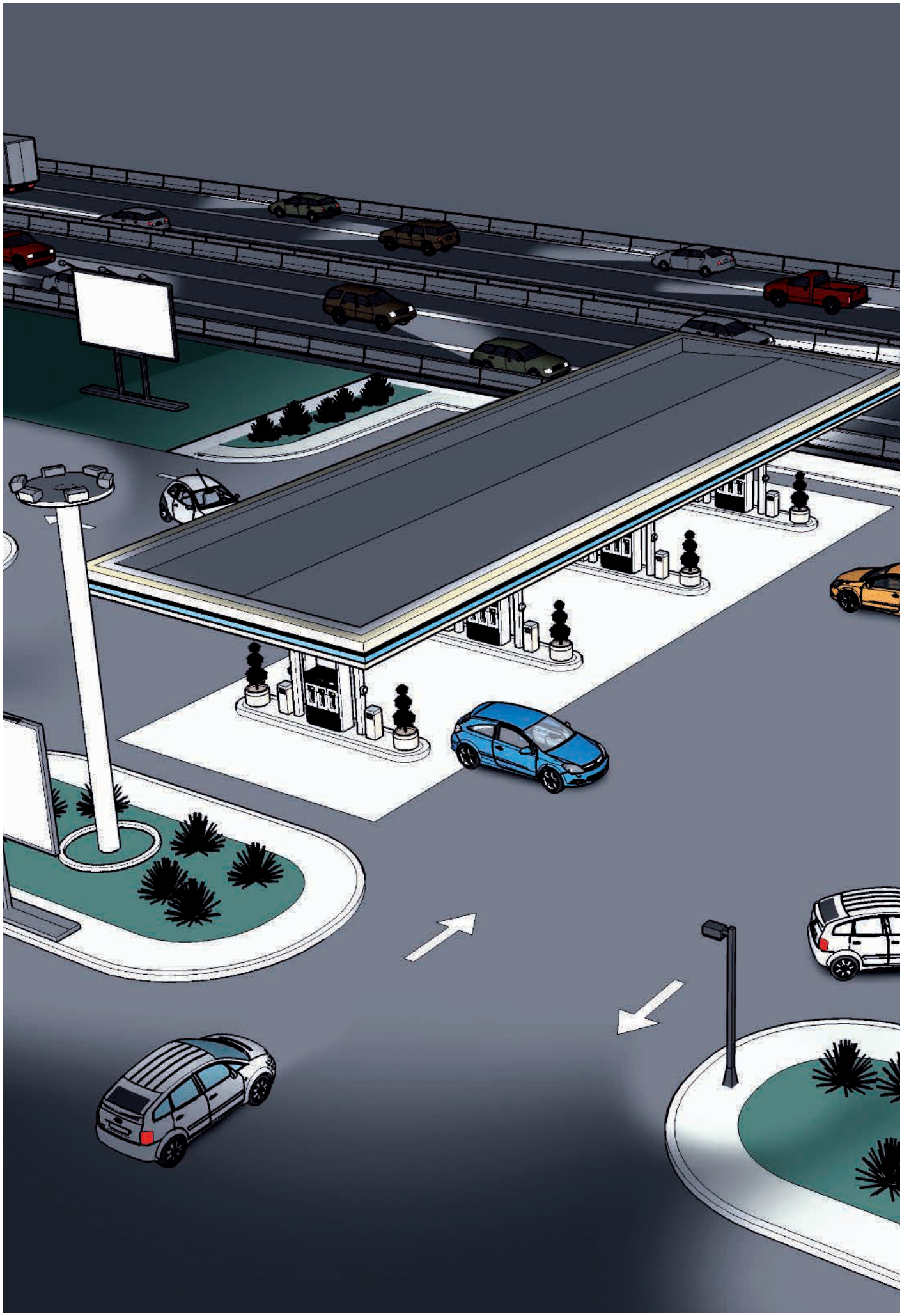
Installation example

As shown in the diagrams, one of the possible applications is the installation of a T1 POLE twilight switch in the motorway lighting system. When the external light falls below a certain level (for example at sunset), the pole-mounted twilight switch switches on the lights to provide the correct lighting for the setting. At sunrise, the external brightness exceeds the threshold value and the twilight relay returns to the open position.

Application environments

The installation of the T1 POLE twilight switch is particularly suitable for controlling public street lighting, thanks to the fact that they can be installed on poles, lamp standards, etc.

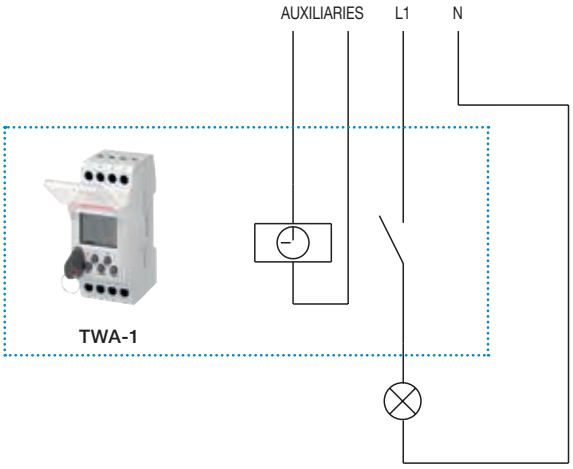




Astronomical twilight switches TWA

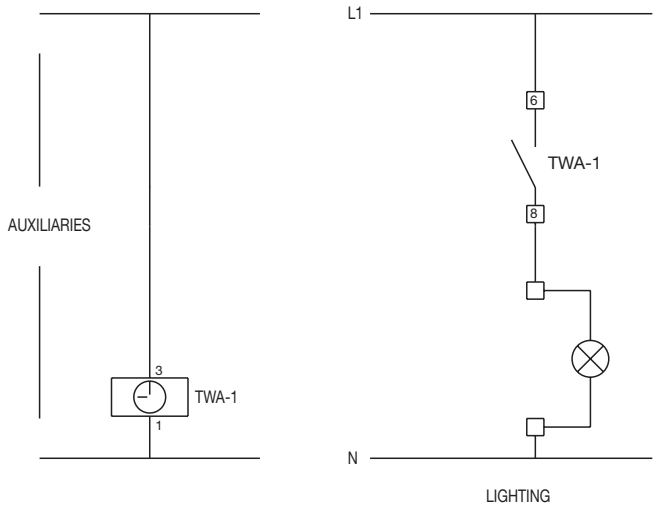
Operating principle

The installation of an astronomical twilight switch in a system is a particularly useful addition for settings and situations in which light sources, or other environmental conditions, can cause changes in the brightness level and falsify the reading. In these cases, the TWA-1 and TWA-2 astronomical switches can control the lighting system according to the sunrise and sunset times of the geographic zone in which the system is installed.



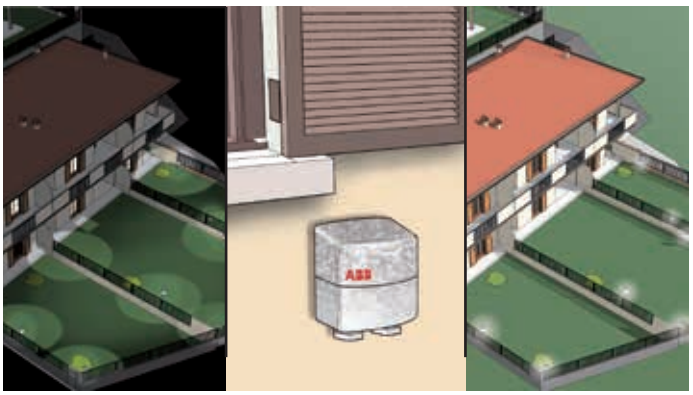
Example of installation

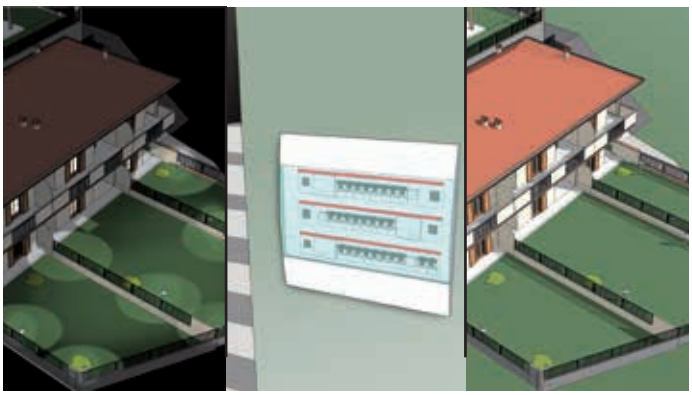
Atmospheric pollution is one of the causes of a reductions in the level of environmental light. Dust deposits on the external probe of a traditional twilight switch can compromise the operation of the device, preventing it from automatically switching off the controlled lighting system in the presence of external light. As shown in the example, this problem can be resolved by installing a TWA-1 astronomical twilight switch that controls the lighting system according to the level of light calculated from the preset longitude and latitude parameters.



Application environments

The installation of the TWA-1 and TWA-2 astronomical twilight switches is particularly suitable for applications in which the operation of a twilight switch with external probe can be falsified or compromised by external agents (such as environmental pollution, overexposure to light, vandalism, etc.).





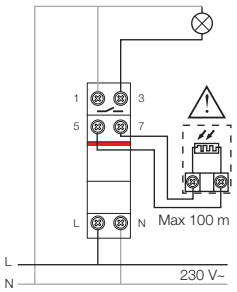
Order codes and wiring diagrams

Order codes

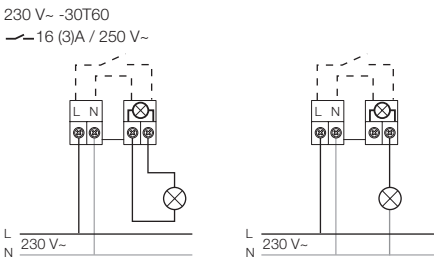
Type of contact	Version	Description type	ABB code	Bbn 8012542 EAN	Piece weight kg	Nr of modules	Pack.
1 NO	Twilight switch, 1 CH	T1	2CSM295563R1341	955634	0,076	1	1
1 NO	Advanced twilight switch, 1 CH	T1 PLUS	2CSM295793R1341	957935	0,078	1	1
1 NO	Pole mounting twilight switch, 1 CH	T1 POLE	2CSM295753R1341	957539	0,140	–	1
-	External sensor	LS-D	2CSM295723R1341	957232	0,069	–	1
1 NO/NC	Astronomical twilight switch, 1 CH	TWA-1	2CSM204365R1341	043652	0,160	2	1
2 NO/NC	Astronomical twilight switch, 2 CH	TWA-2	2CSM204375R1341	043751	0,160	2	1

Wiring diagrams

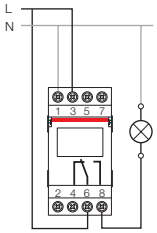
T1, T1 PLUS



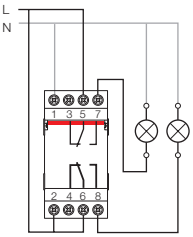
T1 POLE



TWA-1

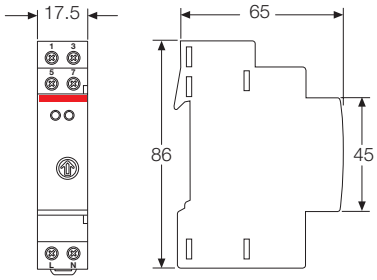


TWA-2

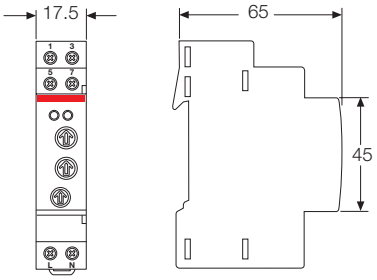


Overall dimensions

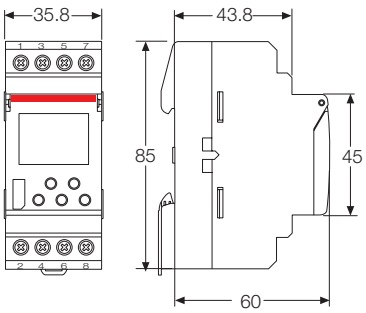
T1



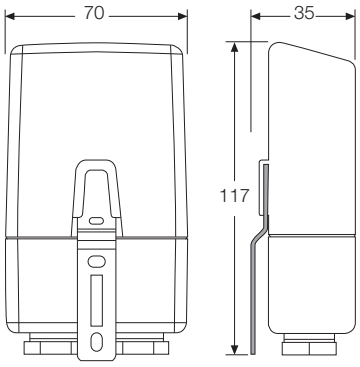
T1 PLUS



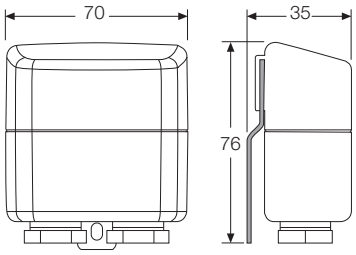
TWA-1, TWA-2



T1 POLE



LS-D



FAQ and problem solving

Why factory calibrated to 10 Lux?
Public lighting plays a crucial role in the social life and represents a mandatory investment for local administrations, without any direct economic return. They must, therefore, try to optimize such investments and how they are managed, while ensuring an efficient service. Because they are factory calibrated to 10 Lux, the standard value for street lighting, ABB twilight sensors are immediately ready for application in public lighting and do not require any adjustment.

Once the twilight sensors have been installed, do they require any special maintenance over time?
Yes, at least once a year you need check the operating state of the circuit-breakers and clean the sensors.

Can the twilight sensor be installed near the lights that it controls? When the lamp switches on in the evening, with the light on will the twilight sensor switch it off again?
It is always better to avoid the problem by distancing the twilight sensor from the lights, thus ensuring that the twilight sensor will be located in a shadow cone and avoiding the lamps being activated by mistake.

Can more than one sensor be connected with models T1 and T1 PLUS?
No, one sensor must always be used for each device.

Can different types of sensors be connected with models T1 and T1 PLUS?
No, the only sensor allowed is the LS-D type.

When must an astronomical time switch be used?
When the length of the connection between the device and sensor exceeds 100 m, or when the connection is too complicated (e.g., switchboard installed in a cellar).
When the sensor cannot be installed away from light sources (amusement parks, camp sites, etc.). When external agents prevent the sensor from functioning correctly, e.g. pollution or vandalism.

Contacts

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