

## About AreaMax™ Photocontrol Failsafe™

Photocontrol Failsafe™ is built into every LED AreaMax luminaire. Photocontrol Failsafe maintains normal dusk-to-dawn operation of an AreaMax without any additional maintenance should the photocontrol fail. This document explains how Photocontrol Failsafe operates.

Upon shipment, the AreaMax is configured for the approximate location where the fixture will be installed. Evluma recommends installing the AreaMax with a photocontrol in place, either new, factory installed, or from the fixture being replaced.

Once installed, the AreaMax immediately begins to collect dusk-to-dawn transition events as it goes through normal dusk and dawn cycles triggered by the photocontrol. Over time, the data collected calibrates the immediate location's light conditions (i.e. in a valley, on a ridge, behind a building, etc.). The data collection cycle will restart if the lamp detects out-of-cycle transitions.

As long as the photocontrol operates normally the AreaMax will continue to collect data. It should be noted that the life of the photocontrol is extended because it is only used as a sensor and is not switching the inductive load of an HID ballast. Inductive "kick-back" and in-rush current are reduced significantly when using the photocontrol in this manner. See also Technical Bulletin TB20110121.1A. This is the same whether a third party photocontrol is used or the AreaMax is ordered with the Evluma integrated photocontrol. The AreaMax's surge protection circuitry provides an additional layer of protection to the photocontrol.

### Daylight Savings Time

Photocontrol Failsafe runs on Coordinated Universal Time (UTC). UTC is the primary time standard by which the world regulates clocks and time. It is, within about 1 second, mean solar time at 0° longitude and does not observe daylight saving time. Daylight Savings Time (DST) is not applicable to the sunrise and sunset calculations in Failsafe. AreaMax scheduled dimming, programmed with ConnectLED™, can be set to observe daylight savings time.

### If the Photocontrol Should Fail

If the photocontrol should fail, the AreaMax detects the condition and executes dusk and dawn schedules based on the geographic location, Real Time Clock time and the refinements for local ambient lighting data collected during previous photocontrol operation. The longer a photocontrol is allowed to run, Failsafe will continue to verify and refine the data collected. Evluma recommends a photocontrol operation period of three weeks to adjust to the conditions established by the immediate environment, such as structures or terrain, which may affect the immediate and unique lighting conditions for the luminaire location.

Depending on the type of photocontrol installed and the time of day the photocontrol fails, Failsafe takes control of the light once three missed transition events are detected. The AreaMax will continue in Failsafe until such time that the photocontrol begins to operate normally again, or is replaced. If a photocontrol is not

installed, the AreaMax will run off the default tables that were calculated for the customer's approximate location.

### Failure Conditions

Most photocontrols are Fail-On (relay contact closed), signaling the lamp should be on.

If the photocontrol fails on and the light was on (Nighttime), at sunrise the lamp will stay on and Failsafe will count this as the first transition missed. The light will remain on at sunset and this will be considered the second transition missed. At sunrise the following day Failsafe turns the light off, taking control of the light. In this circumstance, the lamp will be a dayburner for a full day. See Figure 1.

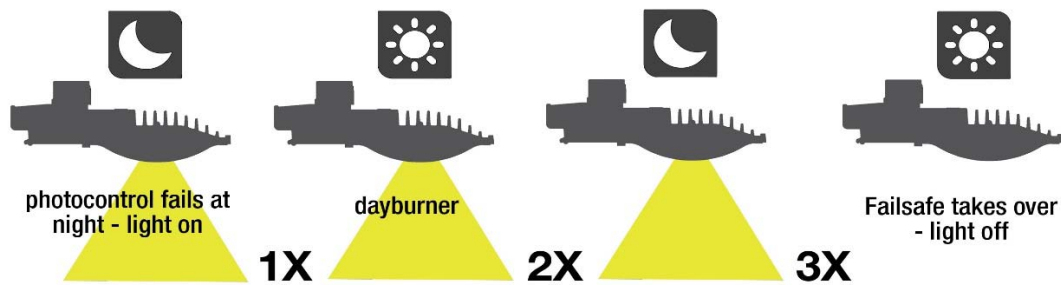


Figure 1. Photocontrol Failsafe acts on the third failed transition.

If the photocontrol fails on and the light was off (Daytime), the lamp will come on when the photocontrol fails. At sunset the light will stay on and this will be the first missed transition. Sunrise will be the second missed transition and sunset will be the third. In this scenario the lamp will be a dayburner for one full day plus part of the previous day. This is the worst-case Failsafe scenario, meaning this is the longest an AreaMax will behave like a dayburner.

A few photocontrols are Fail-Off (relay contact open), signaling that the light should be off. This is rare.

If the photocontrol Fails Off and the light was off (Daytime), Failsafe is aware that it is daytime and the light should indeed be off. If the photocontrol fails to turn the light on at the following sunset, Failsafe will turn the light on. This is the first missed transition. When the photocontrol fails to turn the light off at the following sunrise the second transition is missed. The AreaMax becomes a dayburner for that day. At sunset when the photocontrol fails to turn the light on this is the third and final missed transition. Failsafe will take complete control of the light, turning the light on. Count is always three transitions: sunset-sunrise-sunset, or sunrise-sunset-sunrise. Failsafe acts on the third failed transition.

If the photocontrol Fails Off and the light was on (Nighttime), Failsafe is aware that it is nighttime and the light will stay on. (See Photocontrol Testing, Security Feature) The first missed transition will be when the light fails to turn off at sunrise. The light will remain on at sunset as this is the second missed transition. Failsafe will then take complete control of the light on the third missed transition the next morning. The light is a dayburner for one day.

## **Photocontrol Failsafe OFF**

The AreaMax can be configured with **Photocontrol Failsafe OFF**. If the photocontrol should fail when an AreaMax is configured with Photocontrol Failsafe OFF the lamp will fail to the state of the photocontrol, typically on, becoming a dayburner and alerting you that a new photocontrol is required. This mode is an option for situations where the AreaMax will not depend on a photocontrol for operation, but may be connected to a switch. By default, the AreaMax is configured to Failsafe when it leaves the factory.

## **Photocontrol Failsafe & ConnectLED**

Photocontrol Failsafe is a patented internal process that is built-in to every AreaMax. While every AreaMax is configured to work with ConnectLED, ConnectLED is an optional application that affords additional controls over the AreaMax. ConnectLED (Android, iOS and PC) can be used to update the location of the AreaMax via GPS. This additional refinement to location is used by Photocontrol Failsafe to update the factory configured location settings improving the extrapolated accuracy of each transition. The AreaMax will automatically collect this data over time, so while the GPS location is helpful during the first three weeks of operation, it is not necessary. ConnectLED can be used to view the lamp status to determine if the sensor has failed and operating in Failsafe. ConnectLED can also be used to change the AreaMax from Failsafe ON to Failsafe OFF, or vice versa.

## **Photocontrol Testing**

A security feature of the AreaMax is that it will never turn off if it is within a nighttime cycle. During the fifteen days after installation this feature is temporarily disabled to allow for photocontrol testing. Inducing failure during the first fifteen days during a nighttime cycle will cause the lamp to go off. If three dawn-to-dusk events are missed during this artificial test, Photocontrol Failsafe will initialize and respond according to either 1. the regional settings programmed at the factory or 2. to the official sunrise and sunset times for that exact location if 'Installed' with ConnectLED.

**WARNING:** If no photocontrol installed, the installation of a three-terminal, locking-type shorting cap is mandatory to protect the open socket from the weather. Failure to install a shorting cap may void the AreaMax warranty.

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