Smart Timer Dimming Software Operating Manual

sales@prom-elec.com / ООО ПРОМЭЛЕКТРОНИКА

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Smart Timer Dimming Software Operating Manual

1.Starting up

1.1 About Smart Timer Dimming Software Operating Manual

The Smart Timer Dimming Software is utilized for programming LED driver from MEAN WELL equipped with the Smart Dim feature. The connection between personal computer (PC) and driver is established via the “programmer” hardware interface from MEAN WELL.

What function is provided?

Adjustable maximum output (AOC): This function adjusts the output current to a desired optimum value.

Constant light output (CLO): This function is utilized to compensate the depreciation of the luminous flux of a LED module over life time.

Customized dimming profiles: This function is perfect if there is no way to dim the driver by dedicated control lines due to a lack of infrastructure. It allows automatic dimming via an integrated microcontroller.

Override: This function is to force the output to its maximum brightness.

Fade time: The adjustable time during each transition between dimming levels.

Lifetime: This function gives information of LED module operating hours and possible to indicate a signal at the end of the guaranteed lifespan of the LED module.

Dimming Profile DEMO: This function gives the demonstration of customized dimming profile for verification.

1.2 Prerequisites

1.2.1 System requirements

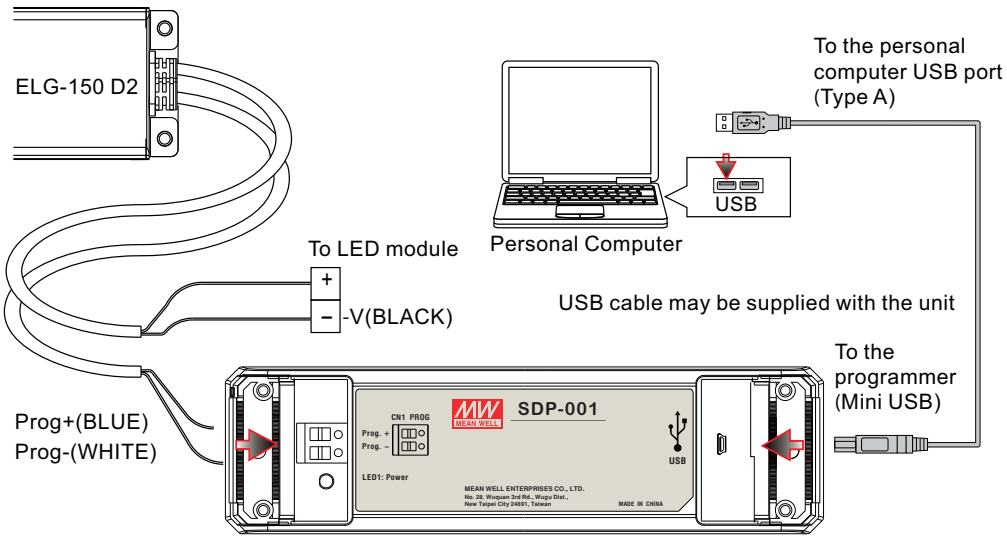
The minimum system requirements for using Smart Timer Dimming Software are:

- Pentium 4 processor 1.8GHz
- 1 GB memory
- One free USB port
- At least 200 MB of free disk space
- Monitor with a resolution of 800 x 600 pixels
- Microsoft Windows Windows 7 or Windows 8.1
- Microsoft .NET Framework 4.0 or higher

1.2.2 Hardware installation

Prior to program a driver, the connection between driver and PC must be established first via the Programmer shown in the figure below. The following steps are suggested:

1.Connect Programmer and PC with the enclosed USB cable. LED1(Green) of Program mer is ON.
2.Connect the programing wires into push terminal of Programmer. Blue wire of driver is to “Prog. +” and White wire of driver is to “Prog. -”.
3.Connect the MEAN WELL LED driver to AC mains.
4.Source a certain amount of load, such as 10% of the rated current or higher, out of the driver.



1.2.3 Software installation

The Smart Timmer Dimming Software is accessable via MEAN WELL and authorized distributors. After the download, the Smart Dim is packed and appears as ZIP file in the download folder. The following steps are suggested:

1) Right-click at the ZIP file and select “Extract All…”.

2) Choose a folder to save the program and click Extract.

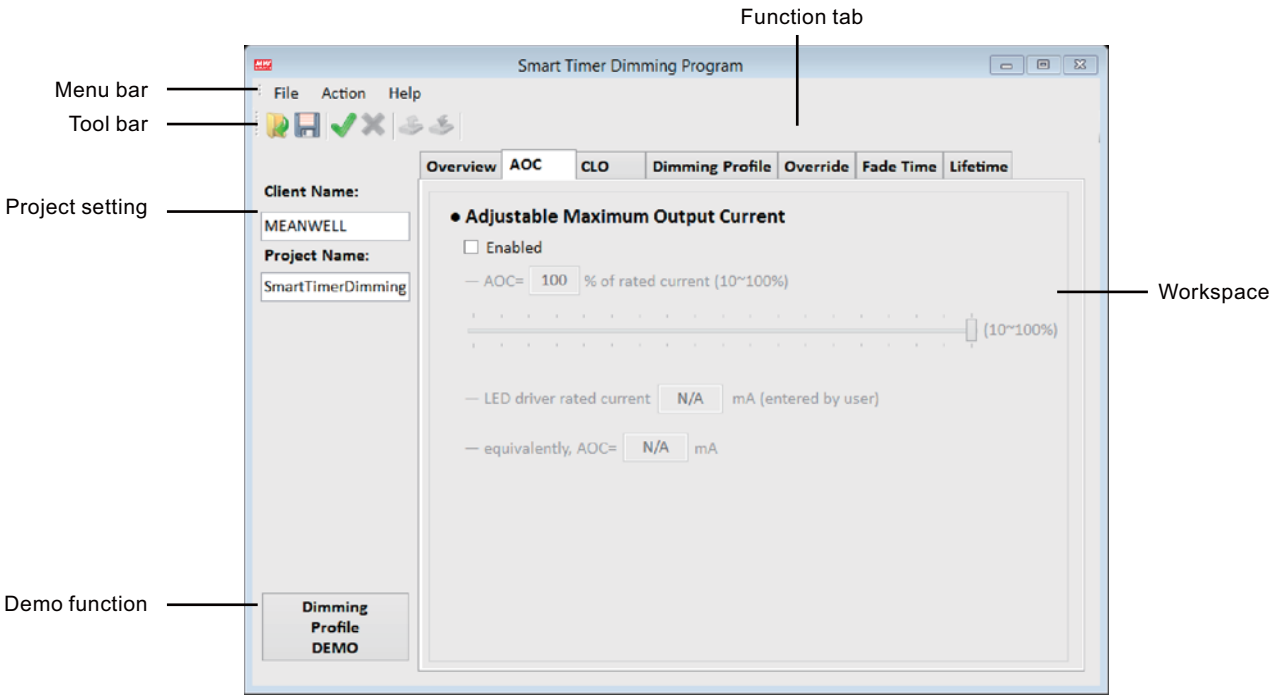
3) If necessary, unplug the USB cable and install USB driver (PL2303_Prolific_DriverInstaller_v1417.exe) and plug-in USB cable again.

4) If necessary, install the Framwork4 (dotNetFx40_Full_x86_x64.exe).

5) Double click the Smart Timer Dimming Program.exe file.

2.User Interface

2.1 Basic layout



2.1.1 Menu Bar

File Action Help

The menu bar provides some basic functions. Submenus are opened by clicking on the menu bar. The menu contains the following elements, each with the listed sub items.

2.1.2 File

Open: Load an existing configuration.

Save: Save the current configuration.

Save as: Save the current configuration to a new file.

Exit: Close the software.

2.1.3 Action

Open connection: Connect PC to Programmer via Com Port.

Close connection: Disconnect PC to Programmer.

Upload to PC: Read the configuration from driver.

Download to Device: Sends the current configuration to the driver.

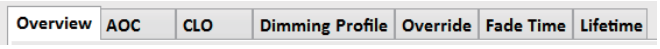
2.1.4 Help

About: Version of software and some other information.

2.1.5 Toolbar

The toolbar provides instant access to the most important functions.

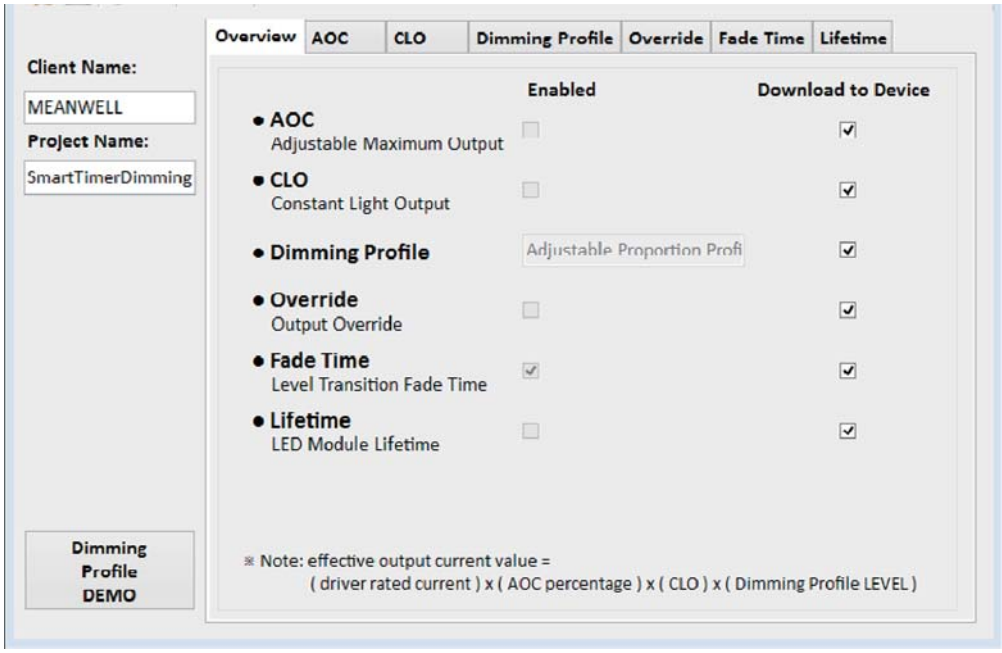
2.1.6 Function tabs



The tabs are used to switch between functions by clicking.

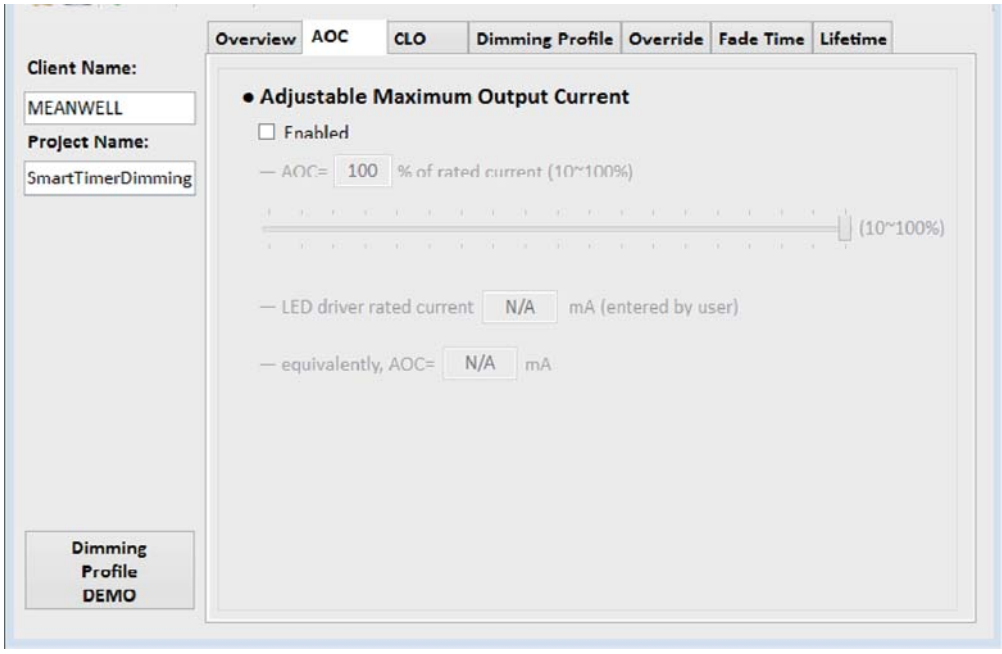
2.2 Overview

The overview tab shows the current setting whether it is enabled or selected for download to driver. In case the specific function is not required to be loaded into driver, the user can tick it off.



2.3 Adjustable maximum output (AOC)

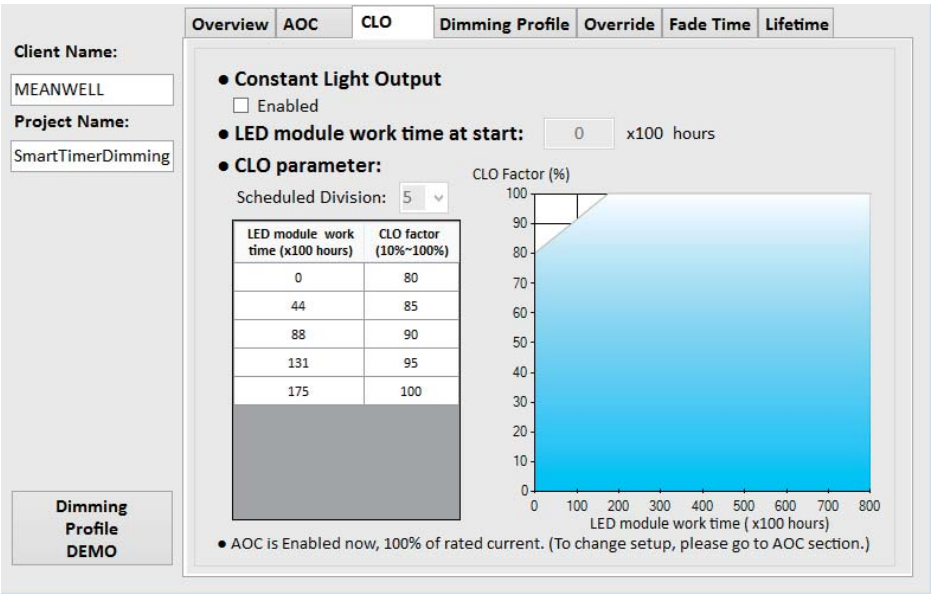
This function allows the user to set/program the output current of driver. The AOC function is first activated by ticking the checkbox and set the relative output level of the max. operating current in [%] between 10~100% or using the control bar. The user can fill in the actual rated current of LED driver in mA and its AOC will be calculated automatically.



2.4 Constant light output (CLO)

This function is utilized to compensate the depreciation of the luminous flux of a LED module over life time.

This **Constant light output** function is activated by ticking the checkbox. CLO parameter is a look-up table for up to 16 data points consisting of the LED module operation time in [100Hrs] and the relative output level of the max. operating current in [%]. The valid range for the LED module operating time is 0 to 800 x [100Hrs] and for the operating current output level is 10 to 100 %. The blue figure is representing the setting in the visual approach. **LED module work time at start** is linked to the first data in the look-up table in **CLO parameter**. This parameter can be set in the Lifetime tab.



2.5 Dimming profile

There are three different dimming profiles available: Adaptive proportion profile, Mid-point-set Profile and Fixed Profile. This function is perfect if there is no way to dim the driver by dedicated control lines due to a lack of infrastructure. It allows automatic dimming via an integrated microcontroller.

2.5.1 Adaptive proportion profile:

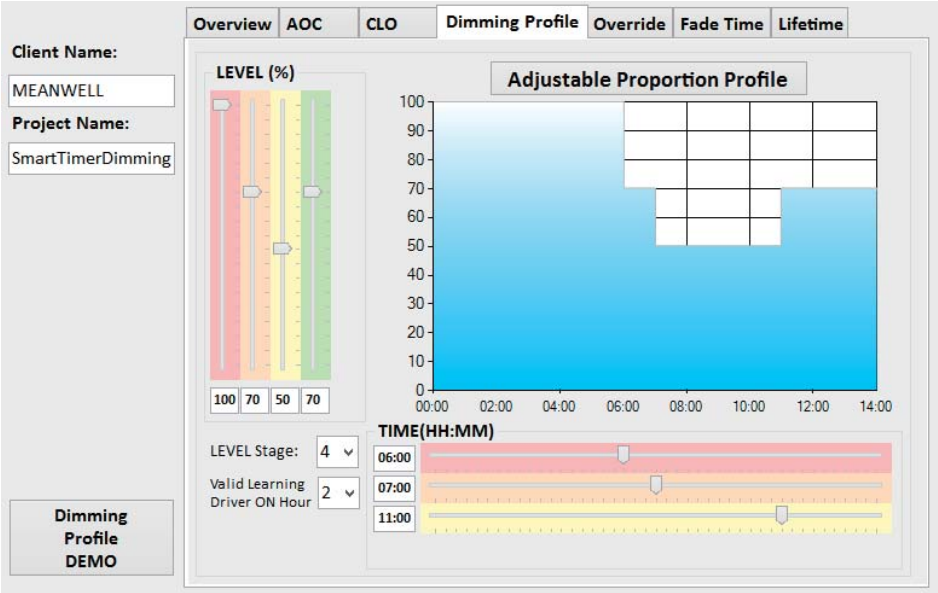
The dimming profile is defined by user. In case the turn-on operating time of driver is varying, the profile is not fixed but self-adjusting it proportionally to the time.

Level stage: 2 to 5 adjustable output level

Valid Learning Driver ON Hour : 1 to 7 selectable. The operating time will only be re-corded into memory of driver after this time. The saved operating time is used to determine the profile which is self-adjustable.

Level bar : Adjusting range 10 to 100%

Time bar : Adjusting range 00:00 14:00 hour



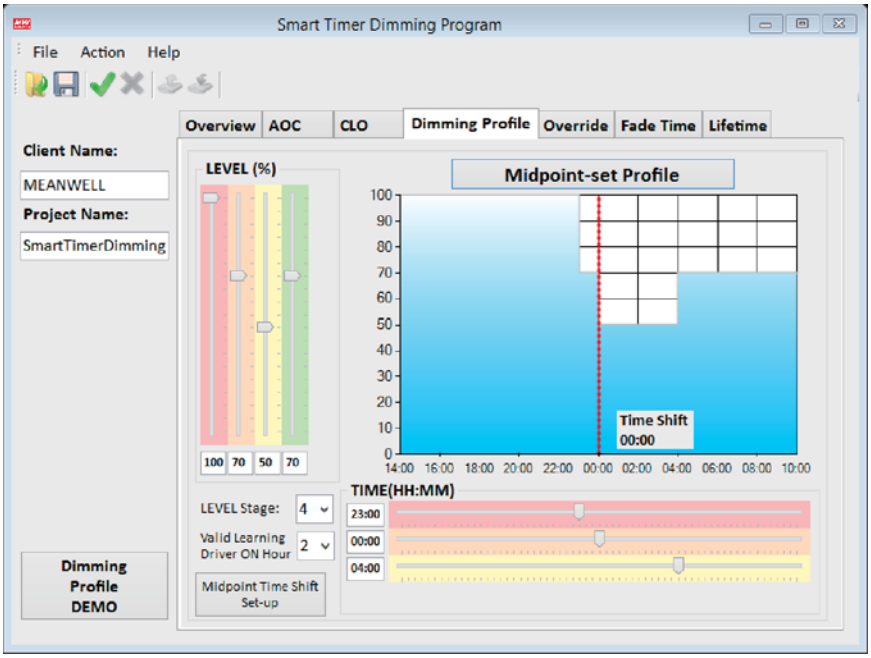
2.5.2 Midpoint-set Profile:

The dimming profile is defined by user. In case the turn-on operating time of driver is varying, the profile is not fixed but centrally based self-adjusting according to the time.

Level stage: 2 to 5 adjustable output level

Valid Learning Driver ON Hour: 1 to 7 selectable. The operating time will only be recorded into memory of driver after this time. The saved operating time is used to determine the profile which is self-adjustable.

Level bar: Adjusting range 10 to 100%
Time bar: Adjusting range 14:00 to 10:00 hour



Midpoint Time Shift Set-up: The mid night point is subject to the location where the driver is installed. This function gives options to compensate the midpoint shift.

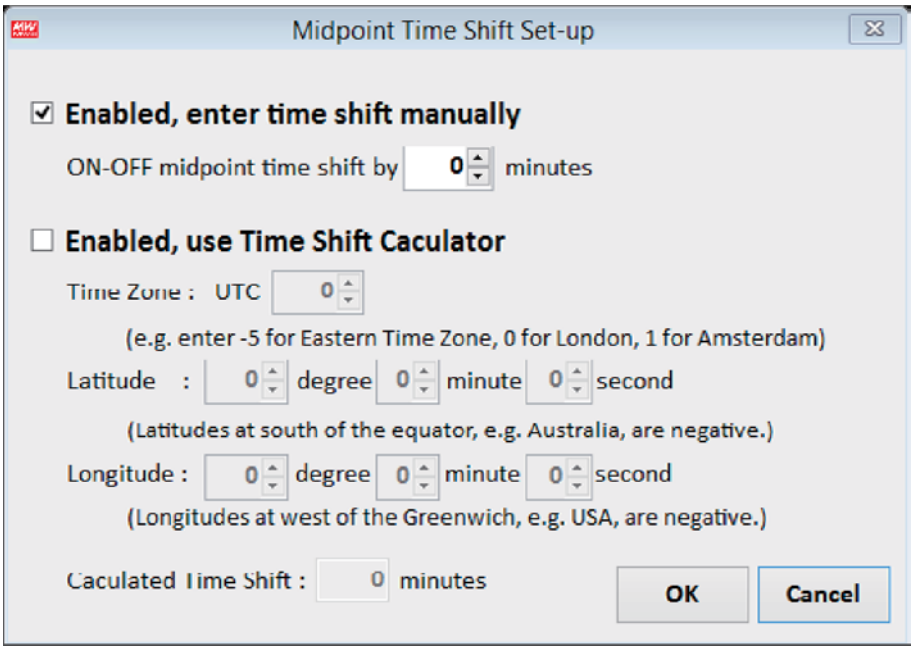
Enter time shift manually: The shift time can be set in [minutes].

Use time shift calculator : The shift time can be calculated by the time zone and location.

Time zone : Enter the time zone. For instance, -5 for Eastern Time zone, 0 for London and 1 for Amsterdam.

Latitude : The coordinates is entered in degrees, minutes and seconds. Latitudes at south of the equator, e.g. Australia, are negative.

Longitude : The coordinates is entered in degrees, minutes and seconds. Longitudes at west of the Greenwich, e.g. USA, are negative.



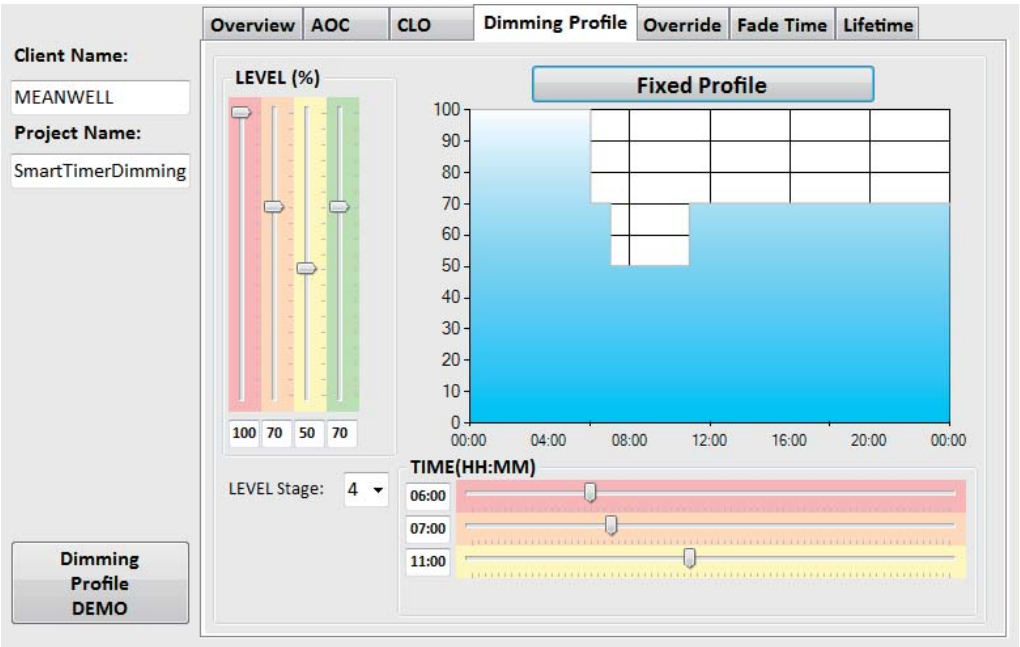
2.5.3 Fixed Profile:

The dimming profile is defined by user. The profile is fixed all the time without the self-adjusting function. The dimming profile is determined the operating time of driver.

Level stage: 2 to 5 adjustable output level

Level bar: Adjusting range 10 to 100%

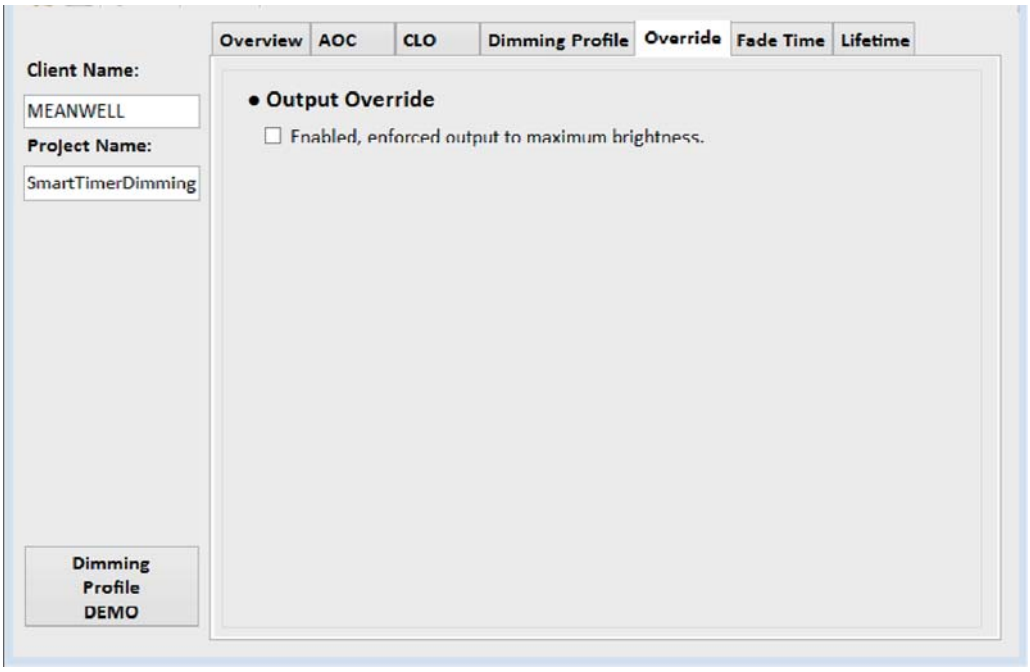
Time bar: Adjusting range 00:00 to 23:59 hour



2.6 Override

This function allows the driver to be at max. output current (subject to AOC and CLO) in case the AC mains is consecutively turn On/Off for three times within 10 seconds. If the situation for override is finished, the next AC On/Off will set the driver back to the corresponding level in the dimming profile.

The Override function is activated by ticking the checkbox.

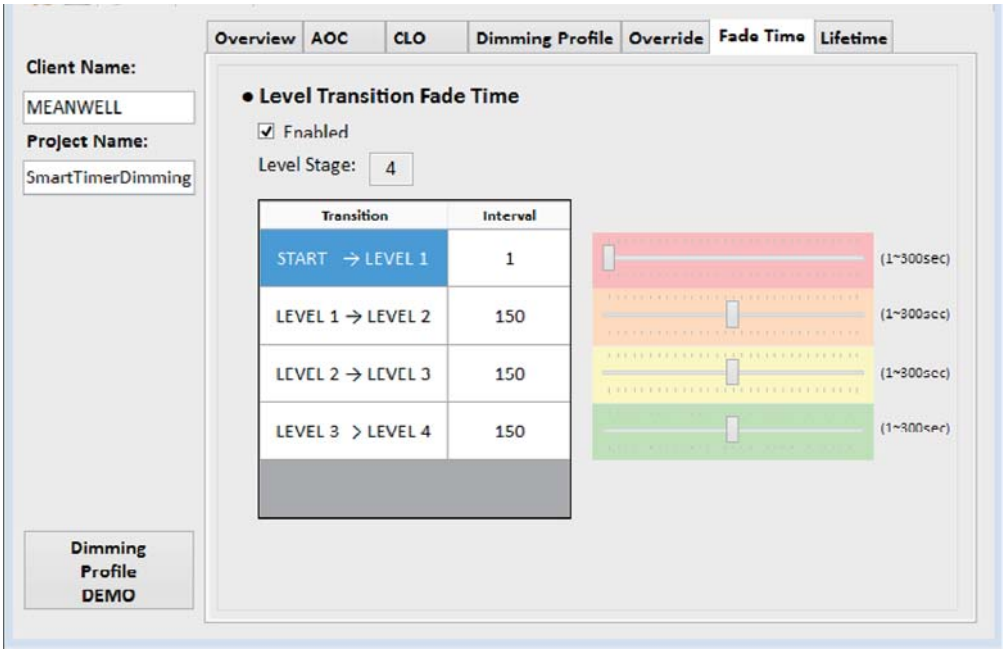


NOTE: Off-time duration should last at least for 1 second, otherwise it will not be counted.

2.7 Fade time

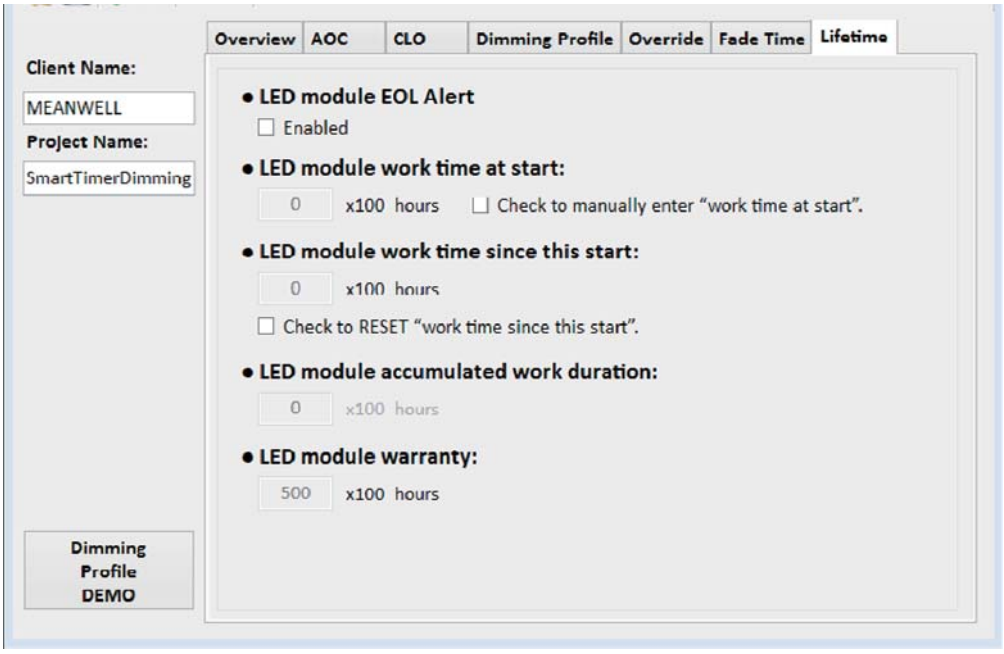
This function allows to set the transition between dimming levels. The number of dimming level is determined in the dimming profile function. The transition time is selectable from 1 to 300 seconds by typing in the table or using the bar.

The Fade time is activated by ticking the checkbox.



2.8 Life time

This function allows the driver to give a warning signal in case the LED module is operating out of the warranty time and also provides some information about LED module.



LED module EOL Alert: The end of life (EOL) function allows the driver to give a warning signal by flashing for 3 times at the beginning of turn-on in case the LED module is operating out of the warranty time meaning **LED module accumulated work duration** > **LED module warranty.**

The EOL function is activated by ticking the checkbox.

LED module work time at start: This parameter is set at zero by default and linked to the first data in the look-up table in CLO parameter. If needed, the value can be manually entered after the checkbox is enabled. It indicates how long LED module has worked before working with present driver.

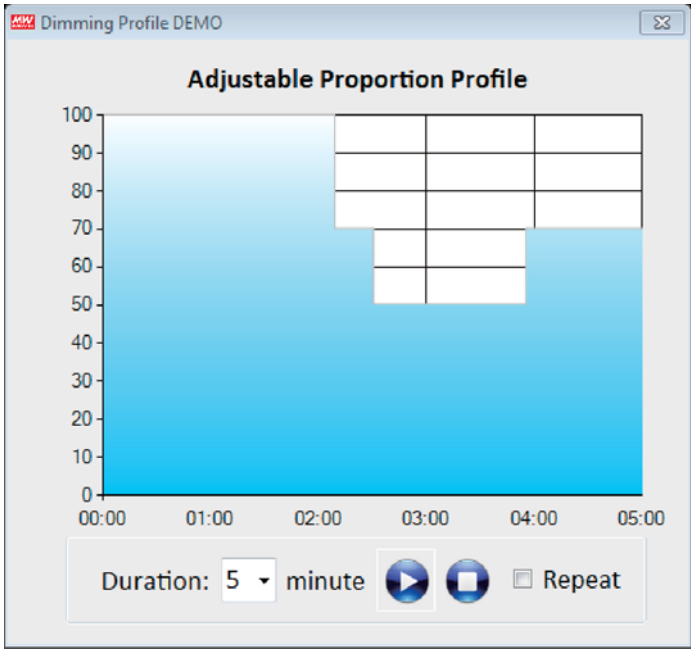
LED module work time since this start: This parameter is automatically counted in [100Hrs] during operation of driver. If needed, the number can be rest by the checkbox. It indicates how long LED module has worked with present driver.

LED module accumulated wtime at start: This parameter is equal to **LED module work + LED module work time since this start**. EOL is executed in case **LED module accumulated work duration > LED module warranty.**

LED module warranty: This parameter can be set in case **LED module EOL Alert** checkbox is enabled.

2.9 Dimming Profile DEMO

This function gives a demonstration for the current settings in the software for user to check if the current setting or dimming profile is correct. The whole demonstration time can be selected between 1 to 5 minutes to shorten the actual operating time. It can start, pause and stop at any time. The repeat of demonstration is possible via the checkbox.



Notice

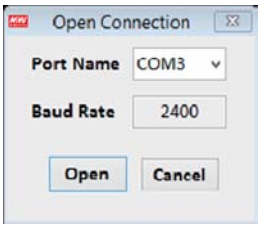
- **Fade time in DEMO mode is 3 seconds.**

3.General operation

3.1 Download to device

The steps described below show how to program a customized dimming profile into the LED driver.

1.Open connection: Choose the corresponding com port of programmer. In case multiple ports are provided, the correct port showing "Prolific USB-to-Serial Comm Port(COMx)" can be found under the device manager in the Windows operating system.



2.Type in the Client and Project name. This is an optional step.

3.Go to the function tab with the following orders: AOC->CLO->Dimming Profile->Override->Fade Time->Lifetime. The above is only for suggestion and can be carried out in any order. Enable and adjust each function that is needed in the project.

4.Use the Dimming Profile DEMO to test and verify the program.

5.Go to the Overview function tab and select which function to be loaded into the driver.

6.To start program the driver, click the Download to Device Icon in the Toolbar or in the Action of Menubar.

7.Save the current setting to a file for the next use if necessary.

3.2 Upload device setting to PC

1.Open connection: Choose the corresponding com port of programmer. In case multiple ports are provided, the correct port showing "Prolific USB-to-Serial Comm Port(COMx)" can be found under the device manager in the Windows operating system.

2.To upload setting of driver to PC, click the Upload to PC Icon in the Toolbar or in the Action of Menubar.

3.The setting of driver is now loaded into software except for the Client and Project name which has not assigned a memory location inside the driver.

4.Go to the function tab with the following orders: AOC->CLO->Dimming Profile->Override->Fade Time->Lifetime. The above is only for suggestion and can be carried out in any order. Enable and adjust each function that is needed in the project.

5.Use the Dimming Profile DEMO to test and verify the program.

6.Go to the Overview function tab and select which function to be loaded into the driver.

7.To start program the driver, click the Download to Device Icon in the Toolbar or in the Action of Menubar.

8.Save the current setting to a file for the next use if necessary.

3.3 Open setting file and download to device

1. Open connection: Choose the corresponding com port of programmer. In case multiple ports are provided, the correct port showing "Prolific USB-to-Serial Comm Port(COMx)" can be found under the device manager in the Windows operating system.
2. Using the Open Icon in the Toolbar or in the File of Menu bar to load the setting from a file.

3. Go to the function tab with the following orders: AOC->CLO->Dimming Profile->Override->Fade Time->Lifetime. The above is only for suggestion and can be carried out in any order. Enable and adjust each function that is needed in the project.
4. Use the Dimming Profile DEMO to test and verify the program.
5. Go to the Overview function tab and select which function to be loaded into the driver.
6. To start program the driver, click the Download to Device Icon in the Toolbar or in the Action of Menubar.
7. Save the current setting to same file or a new file for the next use if necessary.

A.Appendix: Adaptive Dimming Profile Principle

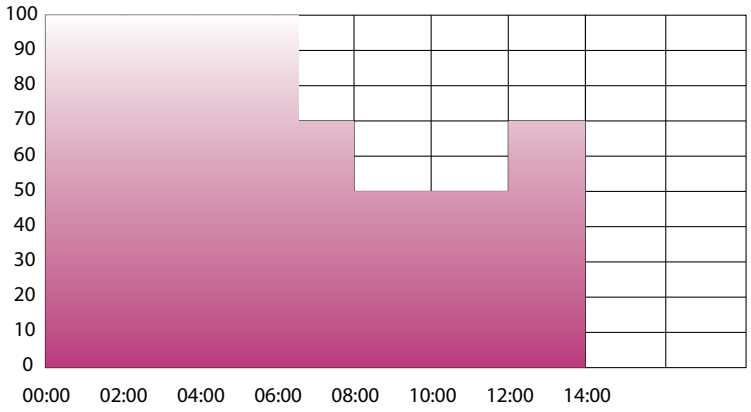
A.1 Principle

This section gives an overview of the profile when the time of AC mains supply to driver is differentbecause of season changing throughoutthe year.

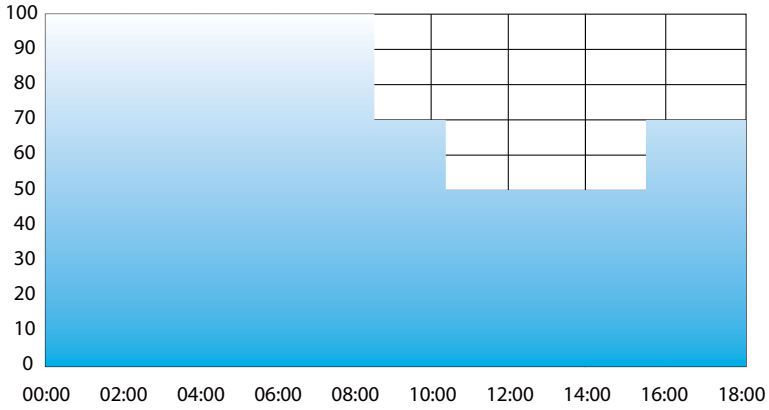
A.1.1 Adaptive proportion profile method

The dimming profile is defined by user. In case the turn-on operating time of driver is varying, the profile is not fixed but self-adjusting it proportionally to the time shown in the figure below.

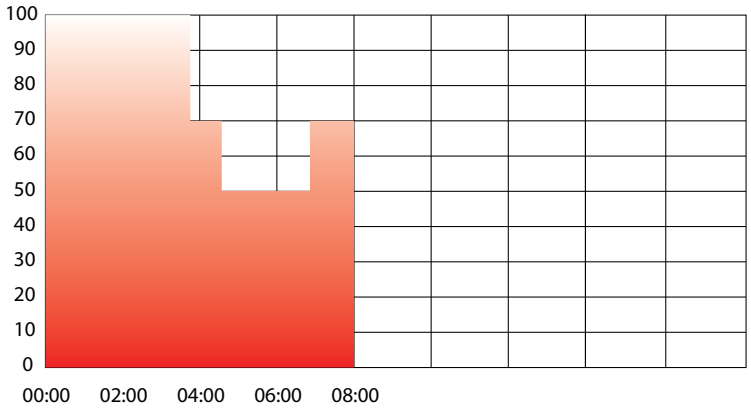
User programmed dimming profile



AC operating time 18 hours in Winter Season



AC operating time 8 hours in Summer Season

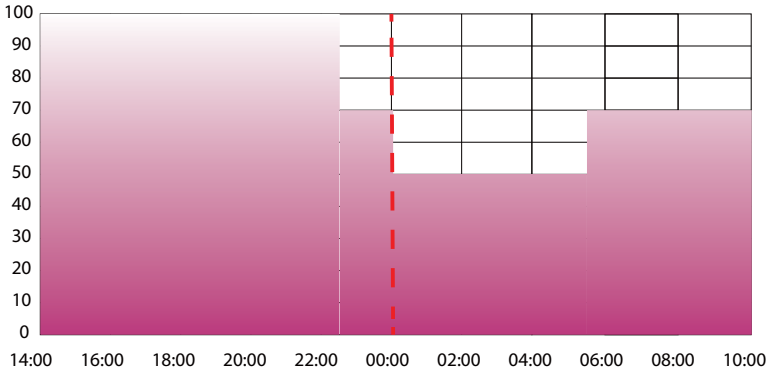


A.1.2 Midpoint-set Profile method

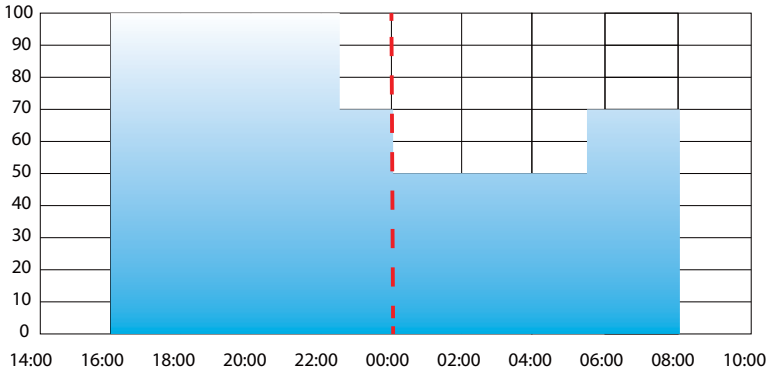
The dimming profile is defined by user. In case the turn-on operating time of driver is varying, the profile is not fixed but centrally based self-adjusting according to the time.

The example in below shows the virtual mid-night function is realized and it does not activate the midpoint shift function.

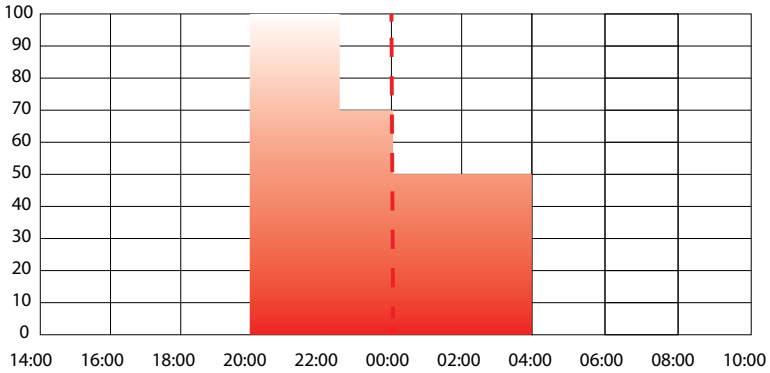
User programmed dimming profile



AC operating time 16 hours in Winter Season



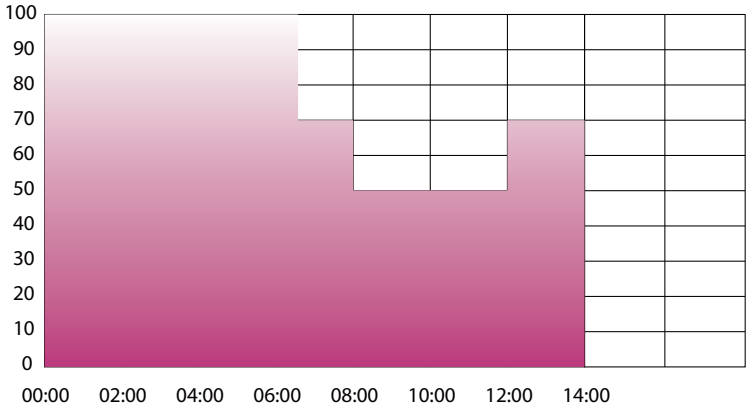
AC operating time 8 hours in Summer Season



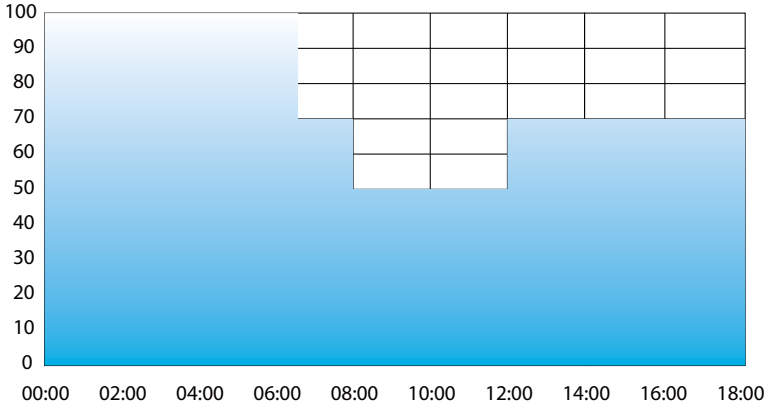
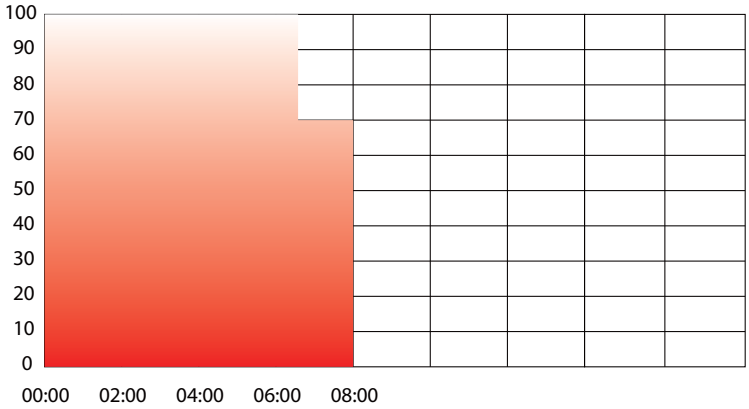
A.1.3 Fixed Profile method

The dimming profile is defined by user. The profile is fixed all the time without the self-adjusting function as illustrated by the diagram below. The dimming profile is determined by the operating time of driver.

User programmed dimming profile



AC operating time 18 hours in Winter Season



AC operating time 8 hours in Summer Season