Advanced Lighting Controller
for dual color LED lights

User's Manual V1.0

12:00

Day: 2/10 - Period: 1

42 LUX

40 LUX

4230 K

4200 K

LUMIX

Touch Screen	10A Outputs to control dual color LED lights	Transistor outputs to avoid flickering	Lux and K-Color Light Sensor	Alarm Relay
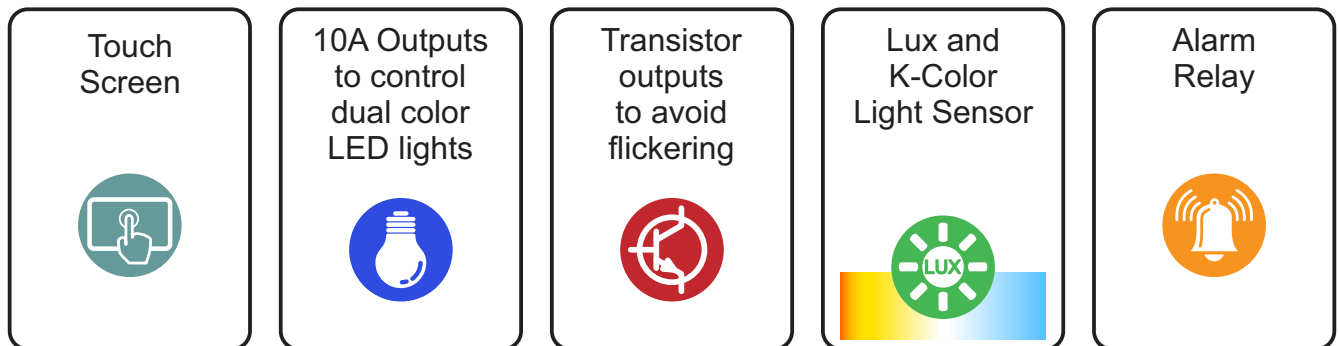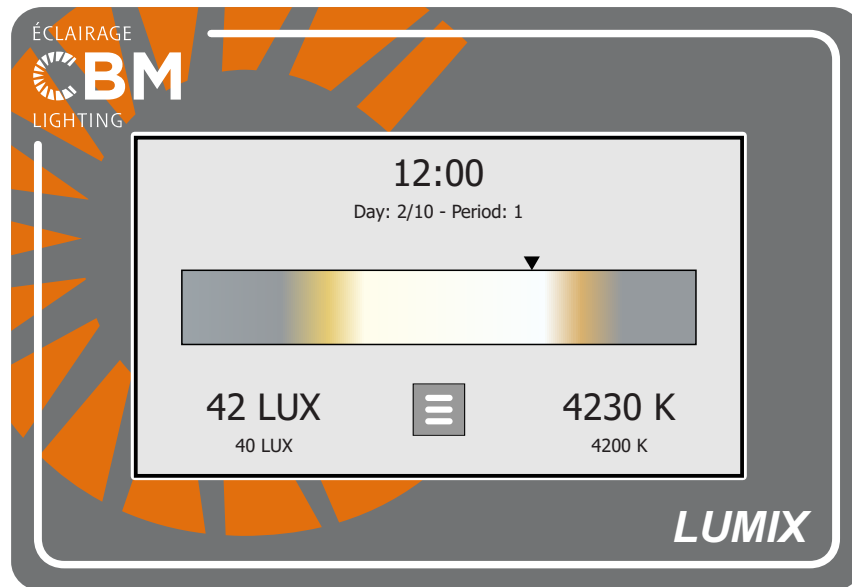
The LUMIX offers an intuitive and easy to use touch screen interface.
This lighting controller allows you to precisely control light intensity as well as
the K-Color of dual color LED lights with the use of the light sensor.
Program the schedule with up to 24 different periods of 24 steps each.
The LUMIX has two 10A lighting outputs
compatible with American and European standards
(120V / 240V, 50Hz / 60Hz)
and an alarm relay

Presentation of the LUMIX

Description:

The LUMIX is a lighting dimmer with a programmable schedule, specifically designed for livestock applications.

It has a light sensor that measures the light intensity in Lux as well as the color of the lighting in Kelvins. This allows it to maintain a steady light intensity and color.

The LUMIX schedule contains 24 different programmable periods. Each period can contain up to 24 lighting steps per cycle.

The LUMIX can also operate as a slave system for a master controller using its 0-10V inputs. It then acts as a power module that converts a 0-10V signal into power applied to the lighting outputs.

A manual mode allows you to control your lighting manually, regardless of the schedule, whether in master or slave mode.

The LUMIX allows you to protect your programmed schedule and settings with two functions:

- A 4-digit access code can be used to lock the system. When the system is locked, no changes can be made to the schedule or settings.

- A non-volatile internal memory allows you to make a backup copy of your schedule and settings.

How the LUMIX works

Lexicon:

Step: a step is a specific point in time. Each step consists of one hour, a set point for the luminous intensity and a set point for the color.

Period: The period is a group of steps, on a 24h cycle. It starts at 00:00 and ends at 23:59. The periods are repeated a certain number of days.

Schedule: The schedule is composed of all the periods. The total duration of the schedule is the sum of the number of days in each period.

How the schedule works:

Throughout the schedule, every minute of the day is a point in time that matches with a step, or that is between 2 steps. The system automatically calculates the intensity and color set points to be applied for each moment of the day according to the steps programmed in the schedule.

Each period will be run sequentially, starting with period 1 on day 1. A period with the number of days at 0 will be ignored. When the last day of the schedule is over, the system will repeat the last period, until the clock is reset to day 1.

How the LUMIX works

The interface:

The LUMIX is fully programmed using its touch screen. Each screen displays different controls that can be operated by a simple touch of the finger, such as buttons or progress bars. The touch screen of the LUMIX detects only one touch at a time. The interface is very intuitive and easy to master.

Lights:

The LUMIX is specially designed to work with dual color LED lights. It can adjust each color independently, and thus create any light intensity of any color that lies within the limits of the lights used. It can also be used in monochrome mode with standard light fixtures. In that case, only the intensity in Lux will be used and both outputs will operate at the same level at all time, except in manual mode.

Light Sensor:

The light sensor is able to measure the light intensity as well as the color of the light that shines on it with great precision. Keep in mind that emitted light as well as reflected light will be detected by the sensor. Avoid mounting the sensor near brightly colored objects.

Alarm Relay:

The alarm relay detects a malfunction of the light sensor that could prevent the LUMIX from functioning properly. A jumper on the electronic board allows to choose a NO (normally open) or NC (normally closed) contact. When the sensor is operating normally, the relay is in its "normal" state: the NO contact is open and the NC contact is closed. When the LUMIX detects that the sensor is not working, the state of the relay is reversed.

How the LUMIX works

Parameters:

Parameter Lock: The lock allows you to prevent changes to the parameters and schedule. A padlock icon will flash to indicate that the system is locked. You have to unlock the system by entering the correct code in order to change the parameters or schedule. You can use a different code each time you lock the system. Only the last code entered will be accepted to unlock. If you forget the code, refer to the "Reset to Default Parameters" section.

Language: Lets you to choose the language of the interface.

Mode: To choose whether the control operates in master mode or in slave mode. In master mode, the system schedule is used to control the lighting outputs. In slave mode, it is a 0-10V voltage supplied by an external source that controls the lighting outputs.

Phase Dimming: Determines the compatibility of the dimmer with the installed lights. Some lights work best with one mode or the other. It's up to you to find out which of the two modes best suits your lighting.

Chromatic Lighting: Allows you to enable or disable color control. Disable color lighting if your fixtures do not support this technology.

How the LUMIX works

Schedule Programming:

The LUMIX schedule consists of up to 24 periods, each of which can contain up to 24 steps. You can use the programming worksheet in this manual to help you visualize the lighting curves you want to program.

Periods

The schedule is a series of periods that follow one after the other. Each period is repeated for a number of days which is programmed for each period.

The Period Scheduling screen allows you to add or remove periods in the schedule and configure the number of days each of these periods will be repeated. This screen also shows you the total duration of your schedule. The schedule can contain up to 12 periods in total.

Press the "Edit" button to access the step programming screen.

Steps

Each period is programmed by placing steps to places which define the desired light level and color adjustments. The system will calculate the dimming slope between the steps automatically. If two steps are at the same level, the intensity will not vary between these two steps. The same goes for color.

Based on the following example:
For lighting that gradually turns on at 8h00 and turns off gradually at 22h00 with a 30-minute slope:

You need to program the following 4 steps:

Step 1 at 8h00 - Light level 0%
Step 2 at 8h30 - Light level 100%
Step 3 at 21h30 - Light level 100%
Step 4 at 22h00 - Light level 0%

This programming will have the following effect:

From 8h00 to 8h30, the intensity of the lighting will increase from 0% to 100% gradually.
From 8h30 to 21h30 the lighting will stay at the same level, 100%
From 21h30 to 22h00 the intensity of the lighting will decrease from 100% to 0% gradually.
From 22h to 8h the lighting will stay at the same level, 0%
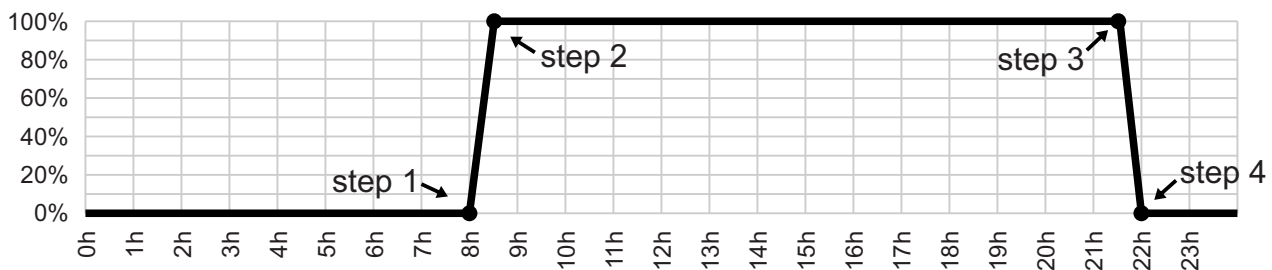
By adjusting these values and adding steps, you can create the ideal lighting curve for your needs.

You can use up to 24 steps in a period.

Use the on screen visualization bar as a guide, it shows you a preview of light variations throughout the period as you modify the steps parameters. You can also use the following page to draw your lighting curve and set the required steps.
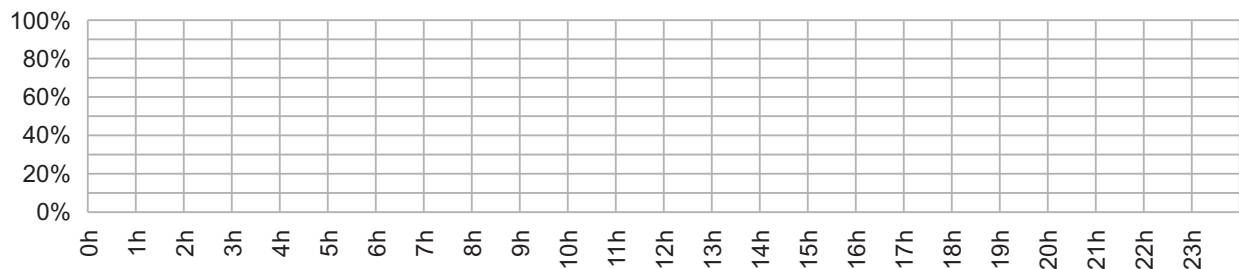
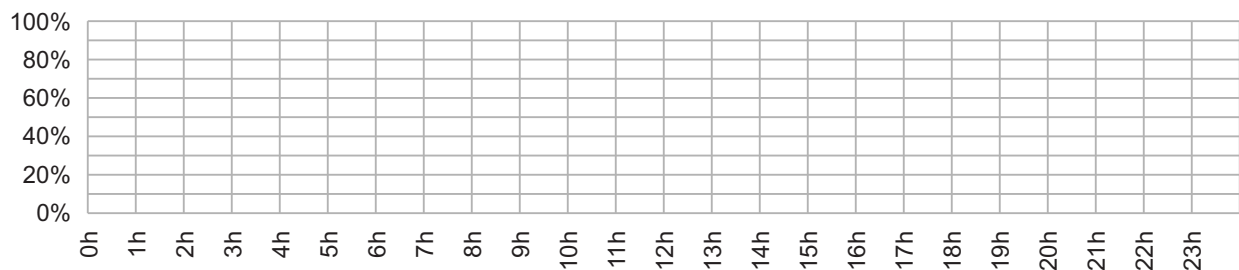# Programming Worksheet

Period: _____   Number of days: _____
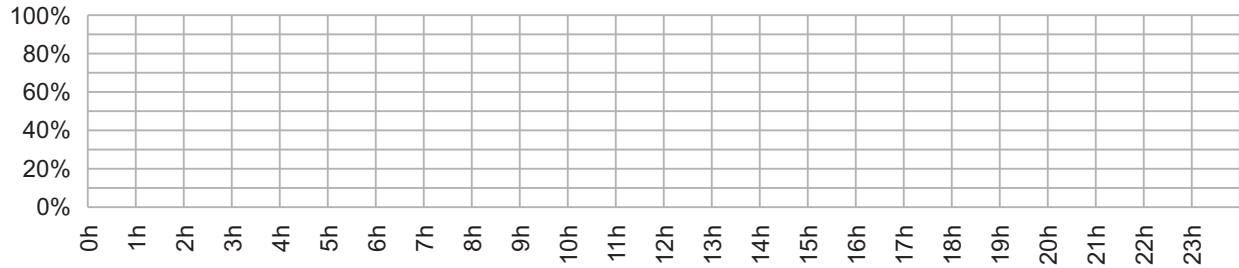
100%
80%
60%
40%
20%
0%

0h 1h 2h 3h 4h 5h 6h 7h 8h 9h 10h 11h 12h 13h 14h 15h 16h 17h 18h 19h 20h 21h 22h 23h

Period: _____   Number of days: _____

100%
80%
60%
40%
20%
0%

0h 1h 2h 3h 4h 5h 6h 7h 8h 9h 10h 11h 12h 13h 14h 15h 16h 17h 18h 19h 20h 21h 22h 23h

Period: _____   Number of days: _____

100%
80%
60%
40%
20%
0%

0h 1h 2h 3h 4h 5h 6h 7h 8h 9h 10h 11h 12h 13h 14h 15h 16h 17h 18h 19h 20h 21h 22h 23h

Period: _____   Number of days: _____

100%
80%
60%
40%
20%
0%

0h 1h 2h 3h 4h 5h 6h 7h 8h 9h 10h 11h 12h 13h 14h 15h 16h 17h 18h 19h 20h 21h 22h 23h
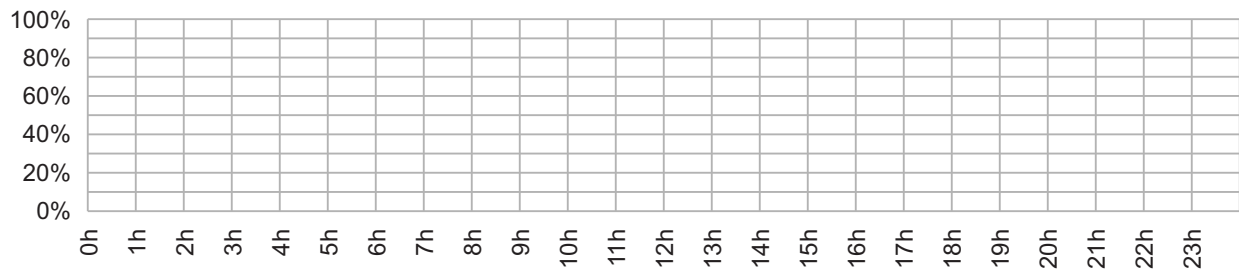
Reset to Default Parameters:

The procedure to reset the system to the default values is as follows:

1- Turn the main power off

2- Remove the battery

3- Wait about 30 seconds

4- Replace the battery

5- Turn the main power back on

This procedure clears all parameters from memory and the system will return to default values.

The schedule is completely erased for both zones.

Touch screen calibration is reset.

The lock code is removed.

After restarting the system, you will need to calibrate the touch screen before you can use it.

Resetting to default values does not affect the internal nonvolatile memory. If you have saved your data, you can always recover it after a reset to default values.

MAIN SCREEN - MASTER MODE

12:00

Day: 2/10 - Period: 1

▼

1: 25%

2: 12%

42 LUX

40 LUX

4230 K

4200 K
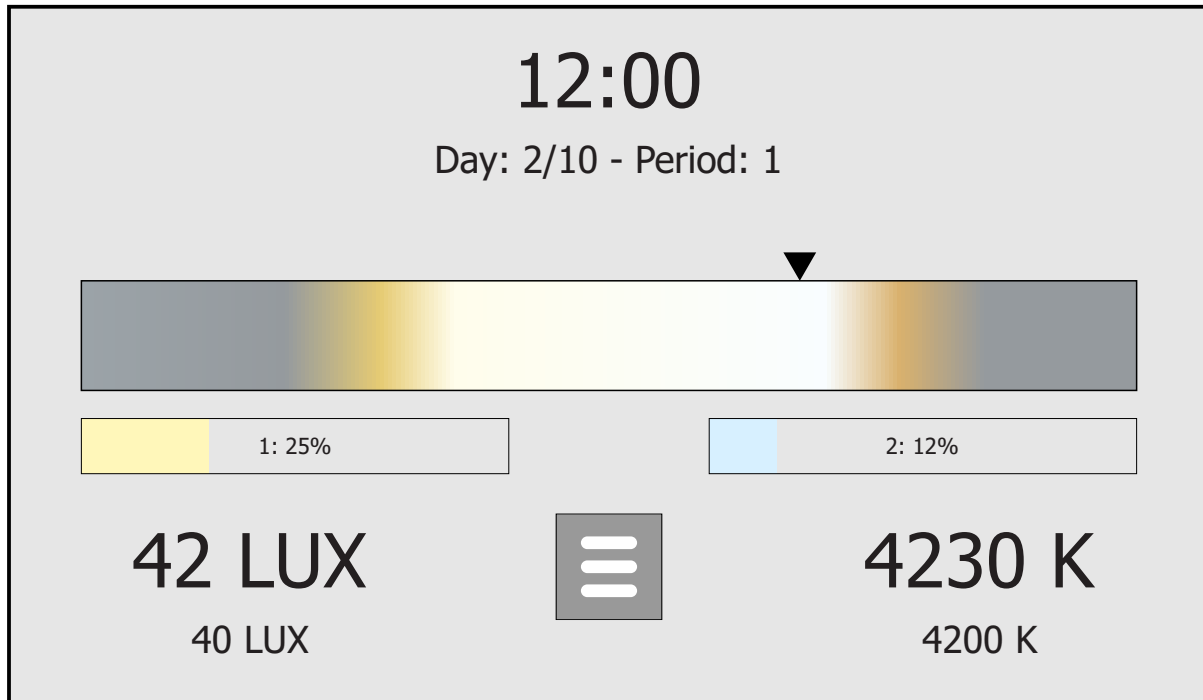
Press to access the main menu

12:00
Current Time

Day: 2/10 - Period: 1
Schedule Progression:
current day: 2
total schedule duration: 10 days
current period: 1

Graphical visualization of the 24h period in progress
which begins from 0h00 left to 23h59 to the right.

▼
Cursor that indicates the current time on the visualization bar.
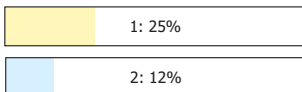
1: 25%
2: 12%
Bars that indicate the power applied to the outputs.

42 LUX
40 LUX
Big characters, the light intensity measured in Lux by the sensor.
Smaller characters is the calculated setpoint for
this specific moment in the schedule.

4230 K
4200 K
Big characters, the lighting color measured in Kelvins by the sensor.
Smaller characters is the calculated setpoint for this specific
moment in the schedule. If the color mode is
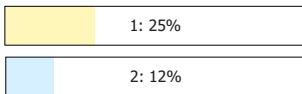disabled this information is not visible.

MAIN SCREEN - SLAVE MODE

12:00

0-10V Input: 1.27V

| 1: 25% | | 2: 12% |

42 LUX
40 LUX

4230 K
4200 K
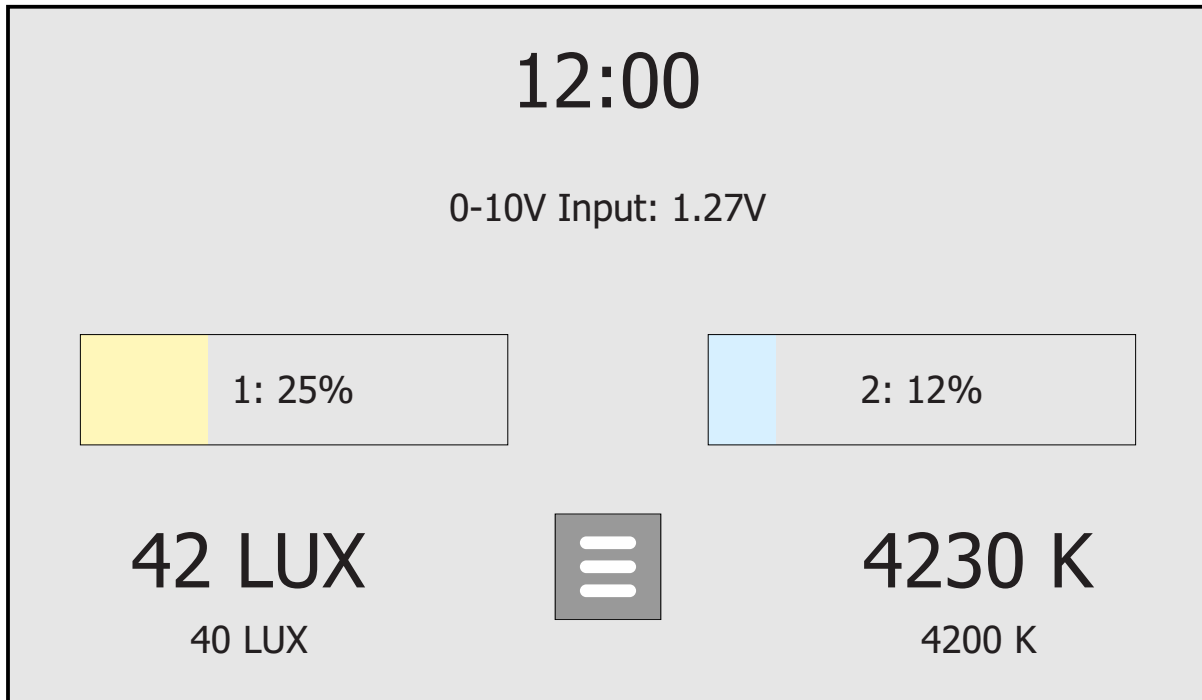
Press to access the main menu

12:00 Current Time

0-10V Input: 1.27V Reading of the measured voltage at the 0-10V input

| 1: 25% |
| 2: 12% |

Bars that indicate the power applied to the outputs.

42 LUX
40 LUX

Big characters, the light intensity measured in Lux by the sensor. Smaller characters is the calculated setpoint based on the 0-10V Input configuration.

4230 K
4200 K

Big characters, the lighting color measured in Kelvins by the sensor. Smaller characters is the calculated setpoint based on the 0-10V Input configuration. If the chromatic mode is disabled this information is not visible.

MAIN MENU

Schedule Programming	
Manual Mode	
Clock Adjustment	
Data Backup / Recovery	
Configuration Settings	
Low level lighting adjustment	
0-10V Input Configuration	
Previous Menu (Main Screen)	
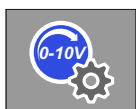
CONFIGURATION MENU

Configuration

Parameter Lock: Off

Language: English

Mode: Master

Phase Dimming: LED

Chromatic Lighting: Yes

◁

Press a parameter button to access the parameter adjustment window.

Press the left arrow to go back.

LOCK / UNLOCK CODE

The code entered is displayed at the top center. The number of lines indicates the number of digits requested for a valid code (4 in this version).

The requested action is displayed at the bottom center. Lock, Confirm or Unlock.

Press the numbers to enter the code.

Press [X] to delete the last digit entered.

Press the checkmark to accept the entered code. If the code is invalid, the code will be erased and you will have to start again.

Press the X to cancel and return to the previous menu.

PARAMETER ADJUSTMENT

Language

English

△

▽

❌

✅

The parameter name is displayed at the top.

The current value of the parameter is displayed in the center square.

Press the up / down arrows to adjust the parameter value.

Press the checkmark to accept the new value and return to
the previous menu.

Press the X to cancel and return to the previous menu.
The value of the parameter will be unchanged.

CLOCK ADJUSTMENT

Clock Adjustment

△   △   △

Day: 1   12:00

▽   ▽   ▽

❌   ✅

Adjust the current day using the arrows above and below the day.

Adjust the hours and minutes using the arrows above and below the time.

Press the checkmark to accept the new time.

Press the X to cancel. The time will remain unchanged.

SCHEDULE PROGRAMMING

Schedule Programming

Total Duration: 20 days

Period		Number of days	
◁	**4**	◁	**3**	▷

Edit

◯✓   ⊖   Number of periods: 1   ⊕

The total duration of the schedule is displayed at the top center.

Use the left and right arrow buttons to select the period to want to program and the number of days for the duration of this period.

Use ⊕ and ⊖ to add or remove periods in the schedule. You have to hold these buttons for a few seconds to confirm the addition or removal of periods.

Press Edit to view the details of the period and program the different steps for that period.

The view bar gives you an overview of the selected period.

Press the checkmark to accept and return to the main menu.

EDIT PERIOD

Period 1				
Step	15:00	120 LUX	4200K	

Use the left and right arrows to select the step to edit.

For each step, adjust the time of the step, as well as the intensity and color using the up and down arrows that are above and below the parameters.

Use ⊕ and ⊖ to adjust the number of steps for this period.
You have to hold these buttons for a few seconds to confirm the addition or removal of steps.

The visualization bar changes in real time as you adjust the step parameters. The slider above the visualization bar shows the time of the selected step on a 24-hour cycle.

Press the checkmark to accept and return to the schedule programming screen.

If the chromatic mode is disabled, you can't program the color

MANUAL MODE

Manual Mode

◁ 1: 25% ▷

◁ 2: 12% ▷
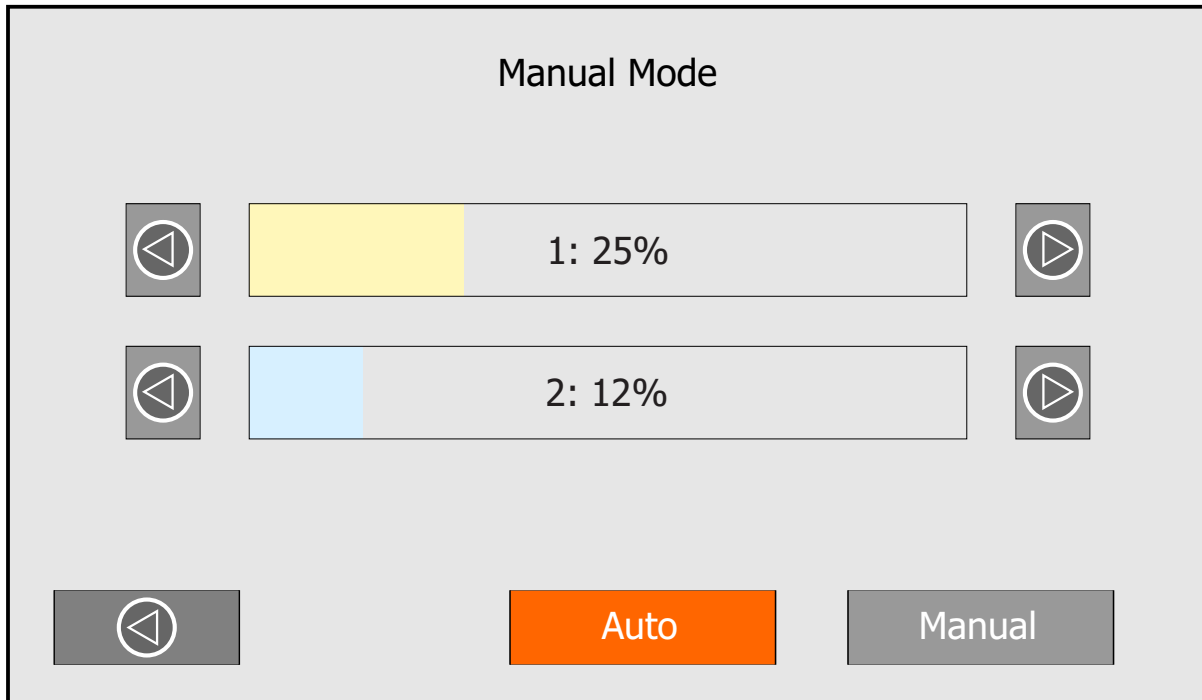
◁ **Auto** Manual

The buttons at the bottom allow you to select Automatic or Manual mode

The top bar controls the red lights (lights connected to output 1).

The bottom bar controls the blue lights (lights connected to output 2).

Move your finger on the bar in the center to adjust the power of the output in manual mode.

Press the arrows on either side of the bar for more precision.

Press the arrow on the bottom left to return to the previous menu

LIGHTS CONFIGURATION

Lights Configuration

- Activate the config button
to set lighting in manual mode
at 0.1%
- Adjust the output levels for
the desired 0.1% lighting

| △ | △ |

| 24.0 | 18.0 |

| ▽ | ▽ |

◁   Config

The "config" button enables or disables the configuration mode.
In configuration mode, the system goes into manual mode and sets the
light level at 0.1% to allow you to adjust the minimum level.

Press the up and down arrows to adjust the minimum level
for zone 1 on the left and zone 2 on the right.

Press the arrow on the bottom left to return to the previous menu.

Note: A light level of 0.1% is the lowest level that can be achieved.
Below 0.1%, the outputs are completely disabled.

0-10V INPUT CONFIGURATION

0-10V Input Configuration

△		△	△
0-10V Input at 1%		10 Lux	5000 K
▽		▽	▽

✓

Press the leftmost up and down arrows to select the input level

Press the up and down arrows in line with the lux and color levels to change them. Each input level has a separate lux and color levels that can be configured.

Press the checkmark to accept and return to the main menu.

When configured in slave mode, the LUMIX adjust the lux and color setpoints by reading the voltage on the 0-10V input and comparing it with the levels configured here.

If the chromatic mode is disabled, the color is not shown.

SAVE / LOAD DATA

Save / Load Data
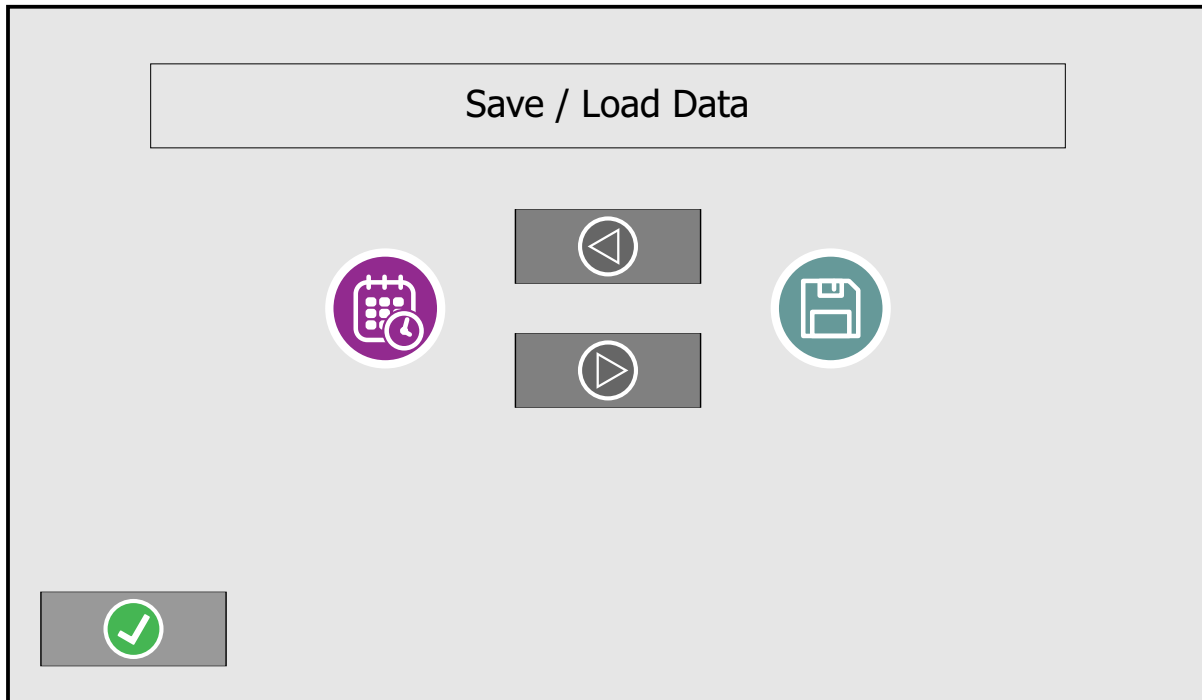
Hold the left arrow to load the data into the calendar.

Hold the right arrow to save the data to the disk (non volatile memory).

As a precaution, you must hold the button until the progress bar
is complete. This will prevent accidental operation from a single touch.

Press the checkmark to go back to the previous menu.

The schedule memory is powered by the battery. If you remove the battery, all
data in the system memory will be reset to the default values,
including schedule data as well as all system configurations.

You can save all this data to the non-volatile memory of the DTD-T.
When all your configurations are done and your schedule is programmed,
save a backup of the data to the non-volatile memory to keep it indefinitely.

If you change the battery or make a mistake when changing your battery
time, you can always load what you have backed up.

Note: You must unlock the system before saving or loading
the data.

TOUCH SCREEN CALIBRATION

⊕

Touch Calibration
Point 1/3
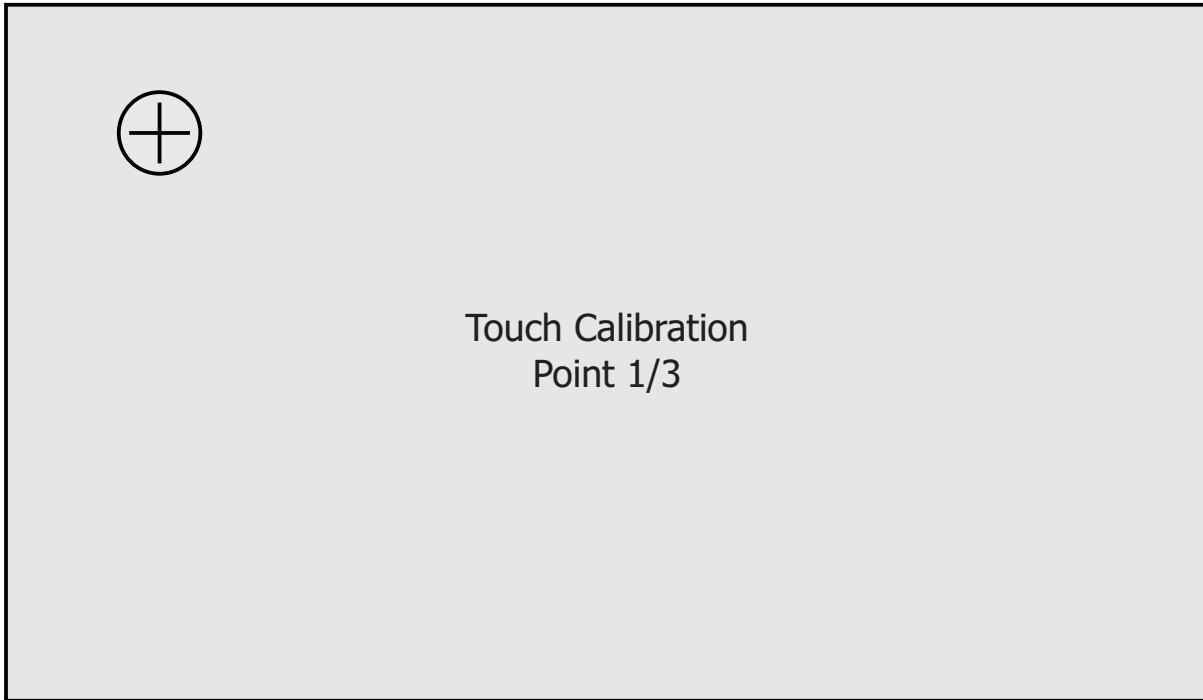
When you power up the system for the first time, the calibration screen will pop up.

Touch the screen on the target for each point.

The target disappears when the screen detects a touch. Release the screen when the target disappears to go to the next step.
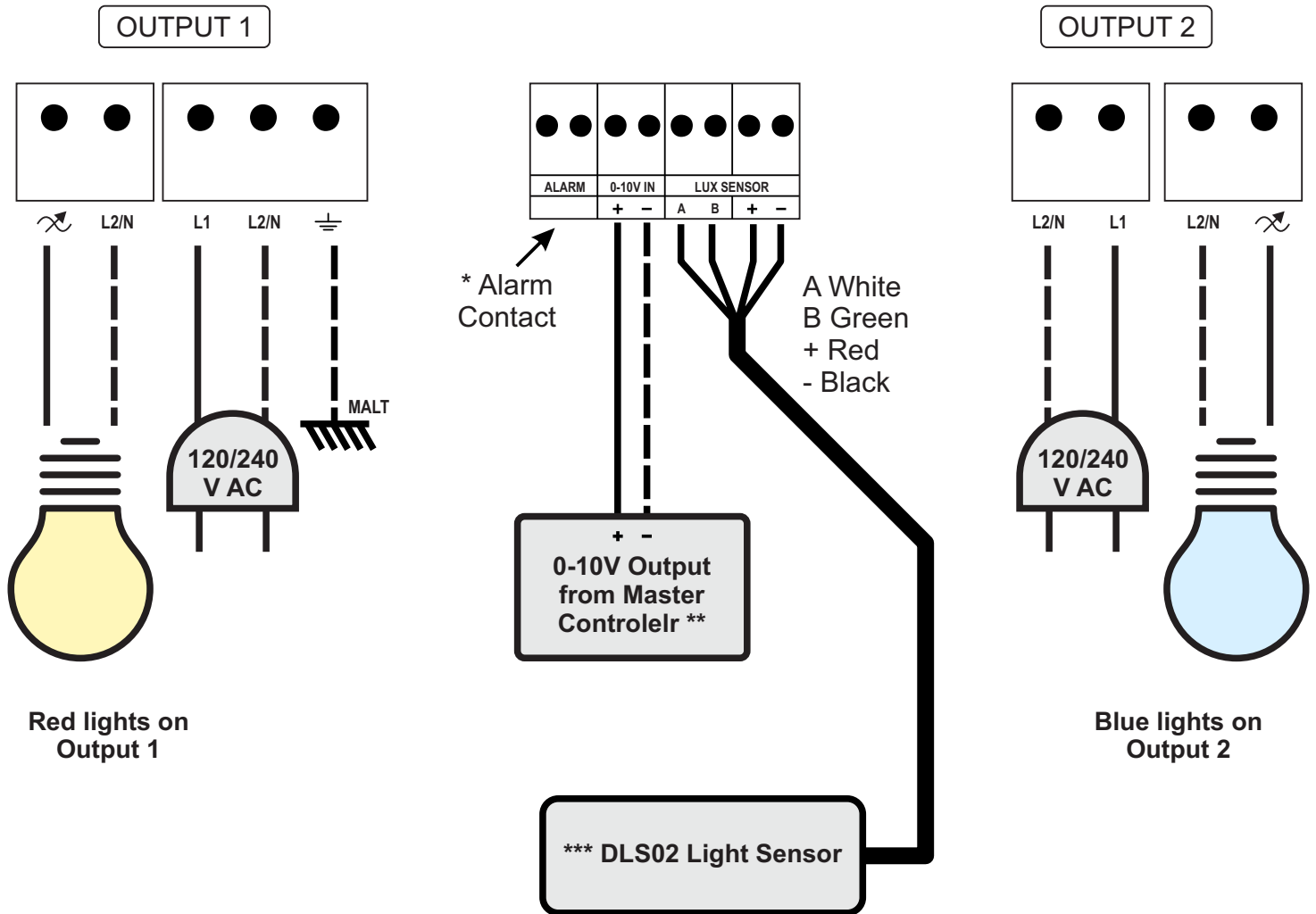
After the calibration is finished, the system will start normally.

The use of a stylus can be useful especially for calibration because its tip is more accurate than a finger.

Avoid using sharp objects that could damage the touch screen.

If you want to re-calibrate the touch screen, you will need to perform a reset to system defaults.

WIRING DIAGRAM

OUTPUT 1

OUTPUT 2

⚡ L2/N   L1   L2/N   ⏚

ALARM   0-10V IN   LUX SENSOR
       +   −   A   B   +   −

L2/N   L1   L2/N   ⚡

* Alarm
Contact

A White
B Green
+ Red
- Black

MALT

**120/240
V AC**

**120/240
V AC**

+ −
**0-10V Output
from Master
Controlelr ***

**Red lights on
Output 1**

**Blue lights on
Output 2**

*** DLS02 Light Sensor

Connect the lights with the lowest K-Color value (ex: 2000K) on output 1
Connect the lights with the highest K-Color value (ex: 6000K) on output 2

* The connection of the alarm relay to an external alarm system must be done according
to the alarm system manufacturer's recommandations.

** The master controller is only required if using the LUMIX in slave mode

*** To extend the light sensor cable, use Belden 8723 type cable or equivalent
for RS-485 applications. It is recommended to weld the splices and cover them
with heat shrink tubing to make the connection waterproof.

Specifications

Main Power: 120/240VAC @ 50/60Hz

Power consumption on mains power 120/240VAC:
DTD-T Basic System: 3.75W
Each Output: 10A absolute maximum
2400W at 240VAC
1200W at 120VAC

Fuse F1: 1A, 250VAC, TR5, Littelfuse #37411000410
Fuse F2 & F3: 12A, 250VAC, Fast Blow, Littelfuse #0314012
Battery B1: 3V Coin Cell CR2032

Alarm Relay: 30VDC, 1A, 100mΩ

Light Sensor: Model DLS2

0-10V Input max voltage: 12VDC
0-10V Input impedance: > 250kΩ

Storage temperature: -40°C à 80°C
Operating temperature: 0°C à 40°C
Max relative humidity: 80% no condensation