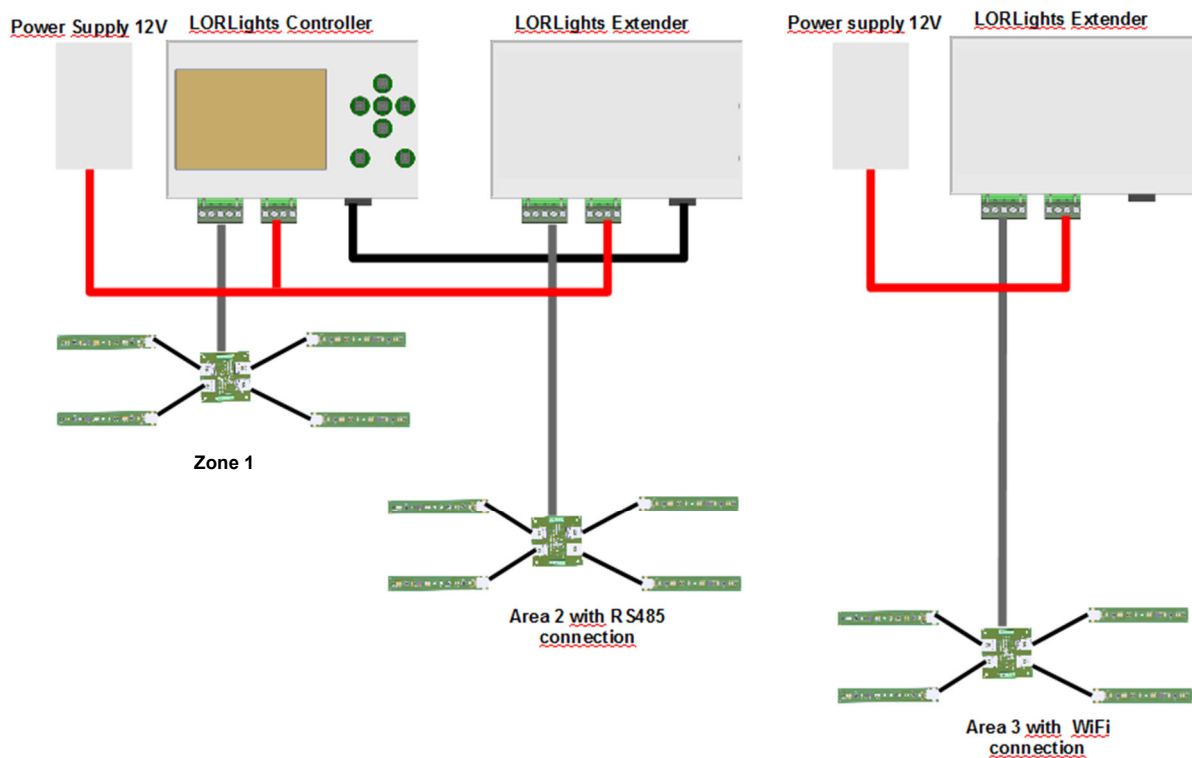


1. Introduction LORLights System

LORLights System is the latest generation solution for the management of lights in pet birds farming. The **LORLights Controller** is equipped with WiFi connection to allow system management by any browser and by the app **LORLights** both on Android and iOS devices. The 4" TFT backlit display with 64000 colours and touch screen grants both an immediate display of the state and an intuitive configuration of the **Controller**.

The **Controller** checks up to 4 areas, and each **Area** can be configured wholly independently of the others; the 4 led pilotage lines integrated within the **Controller** are linked to **Area 1** while, through the **LORLights Extender** extension modules, it is possible to control the led pilotage lines of the areas 2, 3 and 4. The **Extender** modules connect to the **Controller** through connection on the Expansion Bus RS485 by cable RJ45 or by radio through WiFi net. The picture shows an example of a **Controller** configured with three active areas; the areas 2 and 3 are managed by **Extender** connected respectively through RS485 and through WiFi.



Both the **Controller** and the **Extender** modules integrate a temperature and humidity sensor that allows to check the ambient data of the different areas.

LORLights System includes a wide range of **Led Bars** to grant the maximum flexibility as to the kind of daylight (warm light and white light, or white light only), and of nightlight (blue led for moonlight).

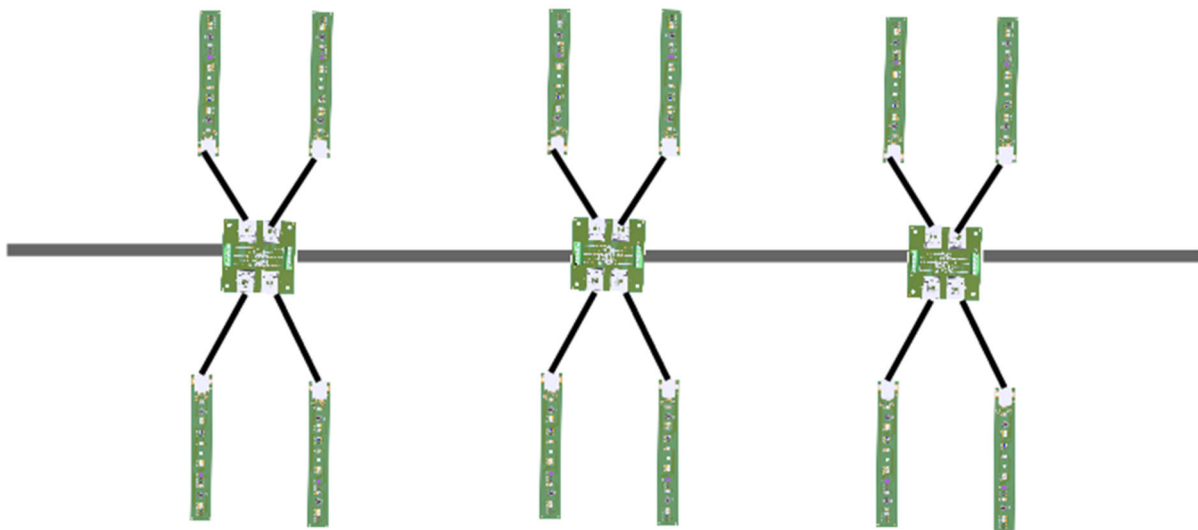
The **Full** version of **LORLights Led Bars** is provided with an innovating led technology for the generation of 295nm UV-B rays, that grants the synthesis at cutaneous level in birds of the **D3**

vitamin or colecalciferol (a derivative of animal steroli) and of the **D2 vitamin or ergocalciferol** (a derivative of vegetable steroli). Such substances will then be transformed in its active form, the **calcitriolo**, that is in charge of many activities in the organism but particularly of the calcium metabolism. It in fact rules the calcium absorption at intestine level and its precipitation as salts in bones and in eggshells during the egg laying.

Moreover, led bars with 3 or 6 white light leds are provided. The connection of the Led Bars is performed through plug RJ12. Every **Bar Led** model is fitted up with a magnet to simplify fixing the bar to the cages.

A special algorithm allows, in case you are making use of bars with warm and white light, to simulate warmer shades of light in the sunrise and sunset phases; as to the nightlight, a further algorithm allows, if enabled, the simulation of moon phases.

The installation of the **Led Bars** is made easier by the **Distributors**, that allow to certify the bars pilotage cables coming from the **Controller** or from another **Distributor** and to relaunch them towards the next **Distributor**. It is possible to connect 4 **Led Bars** to each **Distributor** through 4 plug RJ12.



The inspection function allows to turn on a fast sunrise and a following fast sunset in case it is necessary to inspect the farm during the night phase.

In case of connection to the Internet through WiFi the **Controller** connects automatically to the **LORLights Cloud Platform**; in this case, through the **app LORLights** for both Android and iOS devices, it is possible to manage and check the state of the farm at any time even by remote, to get automatic notice of any faults or blackout, to update the SW of the **Controller**.

The module **LORLights Extender** will be available from July 2021.

2. Configuration of general parameters and net parameters

It is possible to configure the Controller directly through the **Controller** itself, or through a web browser connected to integrated WiFi Access Point.

To use a WiFi connection, it is necessary to login by a PC or a smartphone/tablet to the WiFi net of the **Controller** and then connect to the integrated web server using the following parameters (NB: no password is configured by default to log to the **Controller** WiFi net):

SSID Access Point **Controller LORLights: LorLight (no password)**

Web server address **Controller LORLights: http://192.169.1.1**

It is possible to log to the following configuration parameters:

Menu	Name	Description	Note
General parameters	Installation name	Device name	
General parameters	Language	User interface language	Italian/English
General parameters	SW Version	SW Version	Reading only
General parameters	Build	Date and time of the SW generation	Reading only
General parameters	MAC Address	Serial number	Reading only
General parameters	IP Station	IP address	Valid only if the controller is connected to the router WiFi net Reading only
General parameters	Token	Identifier to sign up the Controller on the cloud portal	Reading only On local interface only
Net	SSID Station	SSID of the router WiFi net	
Net	Password Station	Password router WiFi net	
Net	SSID Access Point	SSID of the Controller' WiFi integrated net	default LorLight
Net	Access Point Password	Password of the Controller' WiFi integrated net	default: no password
Net	IP Access Point	Controller' IP address on the WiFi integrated net	default: 192.169.1.1

	(*)		
Net	Gateway Access Point (*)		default: 192.169.1.1
Net	NETMASK Access Point (*)		default: 255.255.255.248

(*) do not modify, for expert users only

When a WiFi router is available, it is possible to configure the SSID and Station Password parameters, in this case the **Controller** connects to the router WiFi net and the integrated web server is also available at the IP address (that can be displayed in the menu IP Station - General Parameters) given by the router to the **Controller**.

To use the app it is necessary that the Controller is connected to the WiFi router to access the Internet.

As to the password of the **Controller** Access Point it must be considered that such password, if configured, is also required to access the configuration menu, both in local (if it holds only numbers) and through web browser or app. The following table sums up the different configuration options of the **Controller**' Access Point password:

Password Type/Kind	WiFi Access Point Password	Local configuration Password	Web and App configuration Password
Length over 8 characters numbers only	Yes	Yes	Yes
Length over 8 characters numbers and letters	Yes	No	Yes
Length under 8 characters numbers only	No	Yes	Yes
Length under 8 characters numbers and letters	No	No	Yes
Default empty	No	No	No

3. Configuration of Areas and Manual or Automatic Schedule

LORLights Controller can manage up to 4 Areas; it is possible to configure two wholly independent Manual Schedules and two Automatic Schedules for each Area.

The basic element of the schedule (both automatic and manual) is the **Type Day**: the **Type Day** describes the features of a day in terms of time of Sunrise and Sunset, timing/length of Sunrise and Sunset, lights intensity throughout the different phases (Sunrise, Day, Sunset, Night).

As for the 2 **Manual Schedules**, just one Type Day can be settled, whilst in case of **Automatic Schedules**, two Type Days are needed: the first to be used at the beginning of the period and the latter to be used at the end. The **Controller** automatically provides to vary the length of the different phases of the Day (Sunrise, Day, Sunset and Night) during the run of the **Automatic Schedules**.

The following table shows the parameters that can be configured in a **Type Day**:

Name	Description	Notes
Sunrise beginning	Hour and minute of sunrise beginning	
Sunrise length	Length of sunrise in minutes	
Sunset beginning	Hour and minute of sunset beginning	
Sunset length	Length of sunset in minutes	
Day brightness	Light intensity during day phase (%)	Maximum Value 100

For each of the 4 **Schedules** it is possible to configure the following parameters:

Name	Description	Notes
Type Day or Type Day beginning	Type Day for Manual Schedule Starting Type Day for Automatic Schedule	
Type Day end	Final Type Day	Automatic Schedule only
Moon Type	Disabled, Fixed or Variable (Moon phases)	
Fixed moon intensity	Moonlight intensity (blue led) in case of fixed moon (%)	Maximum Value 100

Variable Moon minimum intensity	Moonlight minimum intensity (blue led) in case of variable moon (%)	Maximum Value 100
Variable Moon maximum intensity	Moonlight maximum intensity (blue led) in case of variable moon (%)	Maximum Value 100
UV minutes/hour	Minutes of UV led activation per hour	Maximum Value 60
UV intensity	UV led intensity (%)	Maximum Value 100
Period length	Length of the period (days)	Automatic Schedule only

Eventually, for each **Area** it is possible to configure:

Name	Description	Notes
Area name		
Active Schedule	It allows to choose the active schedule	
Beginning	date of beginning of active schedule	Reading only
New moon date	Date of the new moon	Used in case of variable moon only
Outputs	Configuration of pilotage outputs	See led bars paragraph

4. Inspection Mode

In case it is necessary to enter the farming during Nighttime it is possible to turn on, through the INSPECTION key on the **Controller**, the inspection mode, which consists of a fast Sunrise 15 minutes long and of a following fast Sunset.

At any time, through the ESCAPE key, it is possible to stop the inspection and start the fast Sunset phase.

5. Led Bars

LORLights System is equipped with 4 different kinds of **Led Bars** to satisfy any need, and each **LORLights Led Bar** is provided with a magnet to make fixing it to the cage bars easier. The 12Vdc power supply grants the maximum efficiency as to use and prevents excessive overheating of the bars as well.

The following table sums up the features of the led bars:

Led Bar Type	Description	Connection/Link	Note
Full	6 white led 3 warm white led 1 blue led 1 UVB led	Configuration 1	Bars number <=64 Power supply 10A/12Vdc Outputs configuration Cw-Ww-UV-B
Important: do lay down a trestle at a small distance from the UV-B led (15/20 cm) as the UV-B rays are inclined to dissipate exponentially as the distance from the source grows and do not shade the UV-B led through glasses or plastic materials that could block the uvb rays clearing their effects			
Top	6 white led 3 warm white led 1 blue led	Configuration 1	Bars number <=64 Power supply 10A/12Vdc Outputs configuration Cw-Ww-UV-B
Base	6 white led 1 blue led	Configuration 2	Bars number <=192 Power supply 16A/12Vdc Outputs configuration Cw-Cw-Cw-B
Entry level	3 white led 1 blue led	Configuration 2	Bars number <=192 Power supply 10A/12Vdc Outputs configuration Cw-Cw-Cw-B

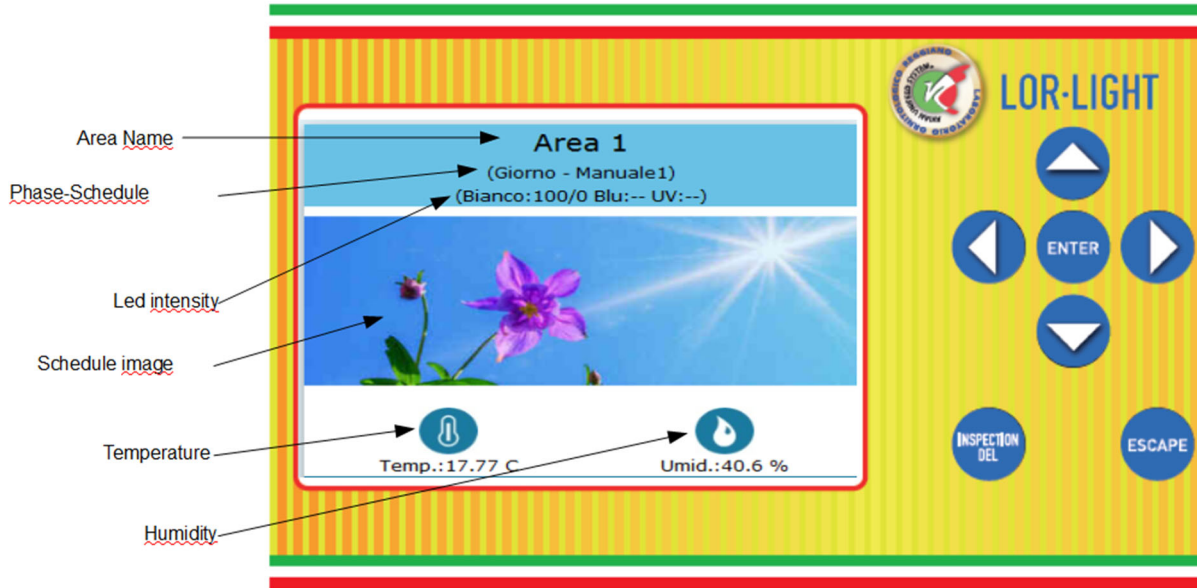
The fit number of Led Bars wants the outputs to be configured as pointed out in the notes and the connections/links made as explained in the outlines in Paragraph 8.

6. Directions for local schedule

The **LORLights Controller** has got a local management interface made up by:






- 4" backlit TFT with 64000 colours
- touch screen
- 7 keys keyboard

As a rule the TFT is off, it turns on touching the screen or through the ENTER key; it will show the state of Area 1:

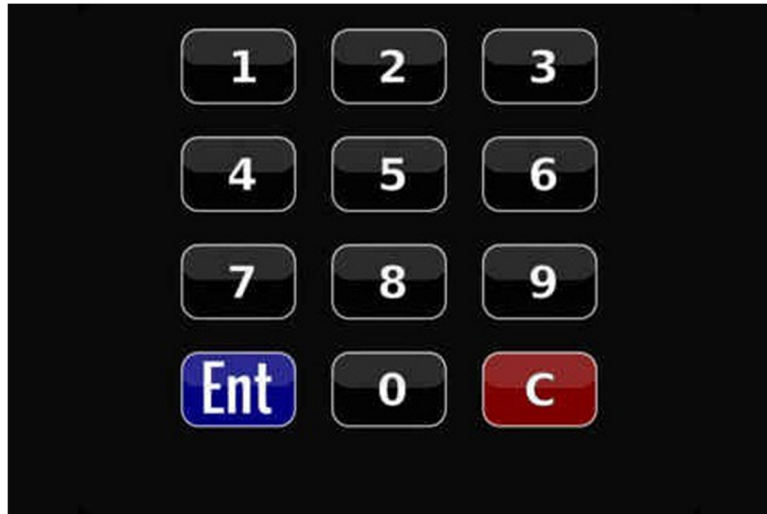


During the Start phase, it is necessary to press the ESCAPE key to enter into configuration.






Through the Right Arrow and Left Arrow keys it is possible to display the state of the 4 Areas; the following table shows the pictures bound to the different phases:

Phase	Picture
Sunrise	
Day	
Sunset	
Night	
Inspection	

Through the ENTER key or a pressure on the touch screen, if the password is on/active you will be asked to enter it by the following digital keyboard



In the following configuration menu, keys change their function according to the contest:

KEYS	FUNCTION
 Up and Down Arrow	A. Choice of a menu entry B. Run over possible values for a parameter character
 Enter	A. Select the menu entry B. Select the parameter to be changed C. Confirm the change made as to that parameter D. Confirm the change/choice made
 Left and Right Arrow	A. Select the character to be changed of a parameter both textual and digital B. Select the option (Language)
 Escape	A. Back to the previous menu/display B. End a parameter' change C. Do not save the changes made on a parameter D. Cancel the change/choice made
 Delete	A. Delete a character while changing a textual parameter

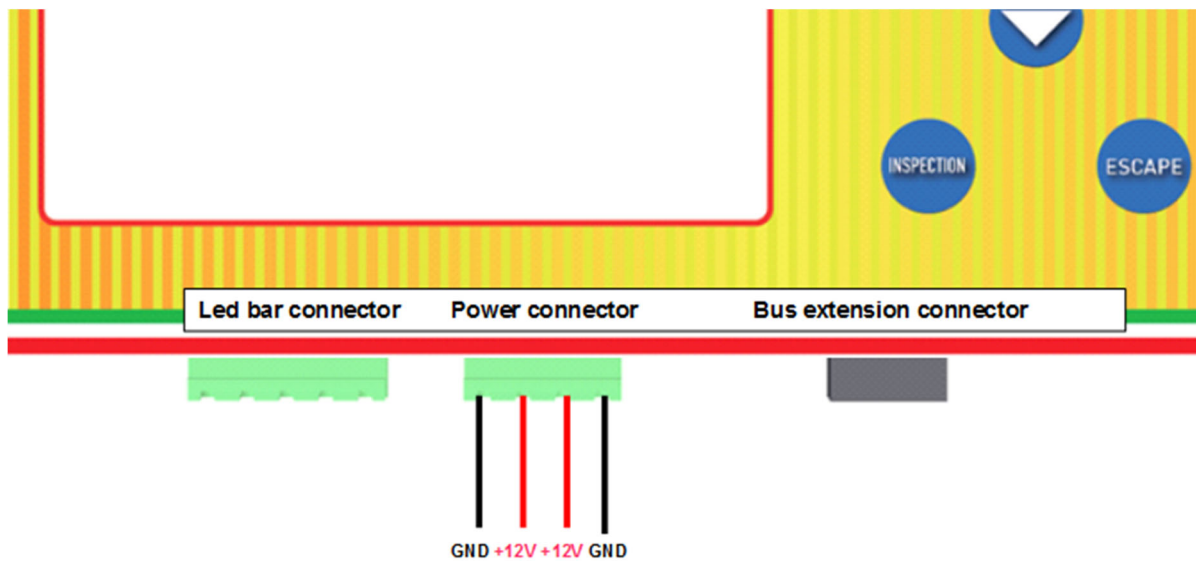
If the configuration menu is off, the INSPECTION key starts the INSPECTION mode.

7. Connections of power supply and led bars

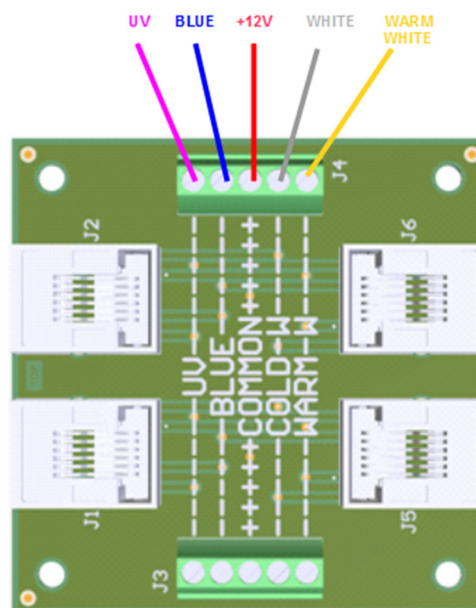
LORLights Controller and LORLights Extender have got the following connections:

- Power supply connector
- Led bars connector
- RS485 extension bus connector

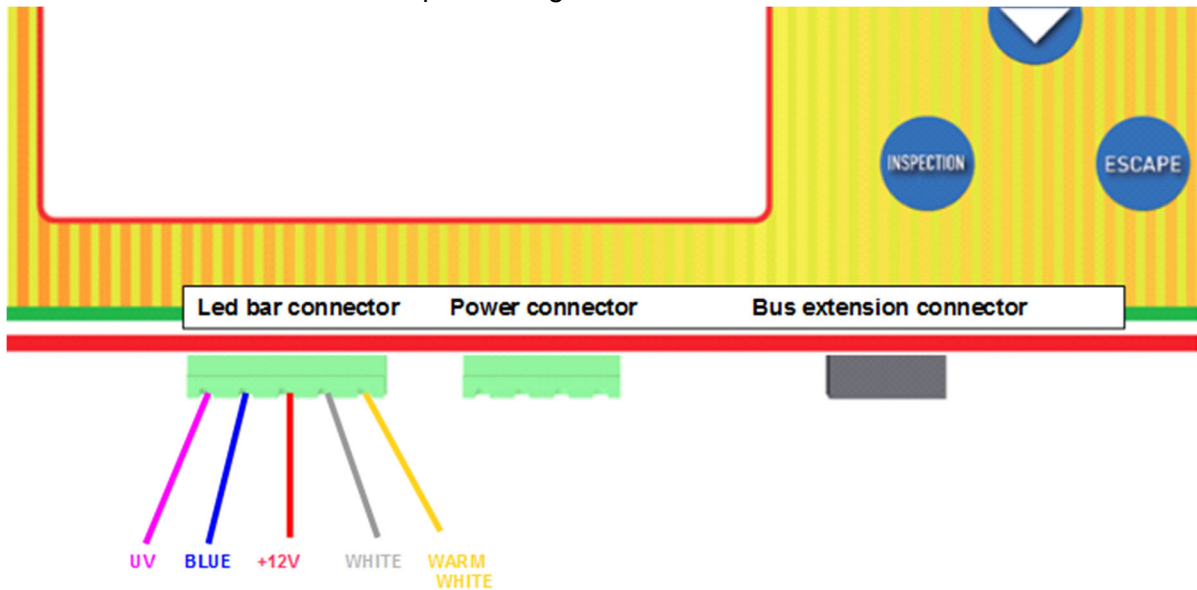
The picture shows the position of the connectors and the connections of the 12Vdc power supply



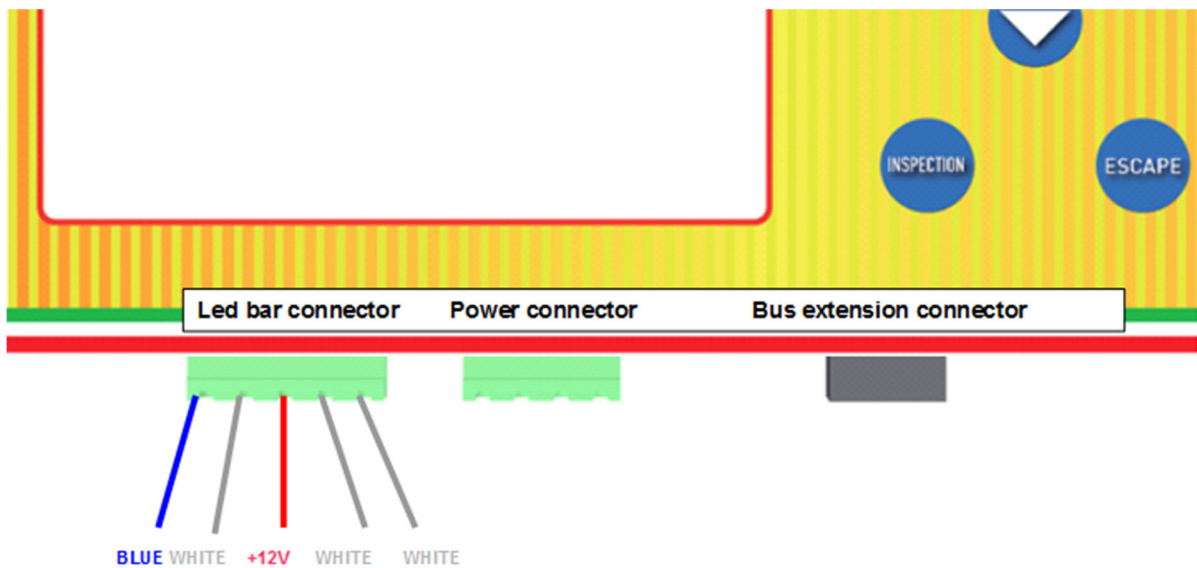
whilst the following picture shows the connections about the **Distributor**



Connections configuration 1
 Up to 64 Full/Top Led Bars
 Power Supply 10A/12Vdc
 Outputs configuration Cw-Ww-UV-B

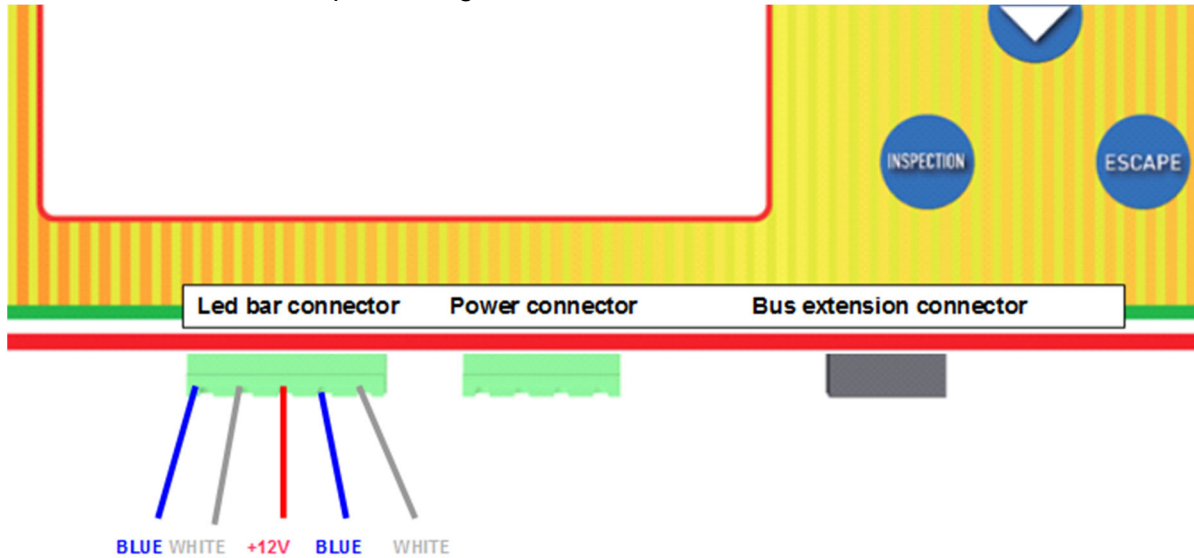


Connections configuration 2
 Up to 192 Base/Entry level Led Bars
 Power Supply 16A/12Vdc for Base Led Bars
 Power Supply 10A/12Vdc for Entry level Led Bars
 Outputs configuration Cw-Cw-Cw-B
 Each Cw (White) line can supply 64 Led Bars at most
 The B (Blue) line can supply all the 192 Led Bars



Connections configuration 3

- Up to 64 + 64 (Area 1 + Area 2) Base Led Bars
- Up to 128 + 128 (Area 1 + Area 2) Entry level Led Bars
- Power Supply 10A/12Vdc for Base Led Bars
- Power Supply 16A/12Vdc for Entry level Led Bars
- Outputs configuration Cw-B for Area 1 and Area 2



8. LORLights App: download, signing in and functionality

The **LORLights Cloud Platform** allows to manage, through Android or iOS **App**, all its **Controller** with a single interface, needless to save the IP address, at any time, both in local/locally and by remote; the interconnection between **Controllers** and **LORLights Cloud** is automatic whenever the **Controller** can access the Internet through WiFi router.

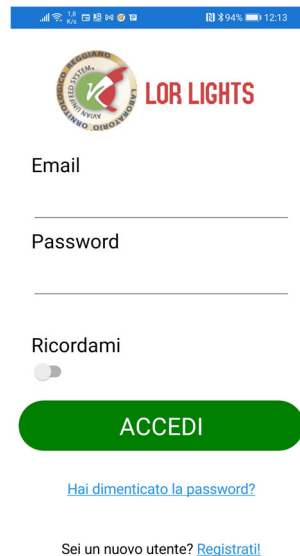
The use of the App grants the following advantages:

- to access through a simple and intuitive interface to the management and the configuration of all one's **LORLights Controllers**,
- to get on one's smartphone all the notifications relating to the changes of phase (sunrise, day, sunset, night and inspection) of the **LORLights Controllers**,
- to display the course/trend both of schedule parameters (intensity) and of ambient parameters (temperature and humidity).

After having got the app LORLights on the stores



and having installed it on one's smartphone, it is necessary to go on signing in on the **LORLighs Cloud Platform**.



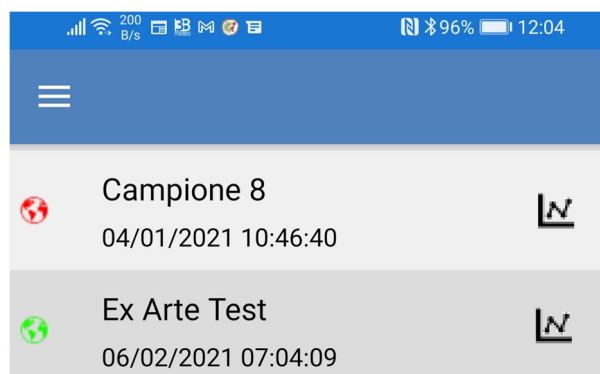
The screenshot shows the login interface for the LOR LIGHTS system. At the top, there is a status bar with signal strength, Wi-Fi, cellular data (200 B/s), battery (96%), and time (12:13). Below the status bar is the LOR LIGHTS logo. The login form consists of two input fields: "Email" and "Password". Below these fields is a "Ricordami" (Remember me) toggle switch, which is currently turned off. A large green button labeled "ACCEDI" (Log In) is positioned below the form. Underneath the button are two links: "Hai dimenticato la password?" (Forgot your password?) and "Sei un nuovo utente? Registrati!" (Are you a new user? Register!).

through the suitable link available in the app; once the signing in is over, it is necessary to complete the signature to the **LORLighs Cloud Platform** through the link in the email the platform sent to the email address used in the signing in form.

It is then possible to login through one's credentials and to associate one or more **LORLighs Controllers** by the suitable menu entry "ADD DEVICE".

Note: to carry out the association it is necessary to digit the token available in the General Parameters menu of each Controller if it is properly connected to the Internet; if the Controller' WiFi net parameters are properly configured, in the General Parameters menu the fields "IP Station" and "Token" must be displayed.

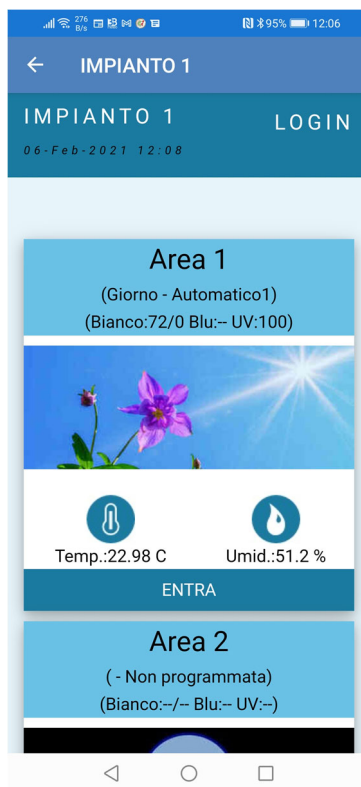
Once the association of one's devices is finished, they will appear in the App list of devices



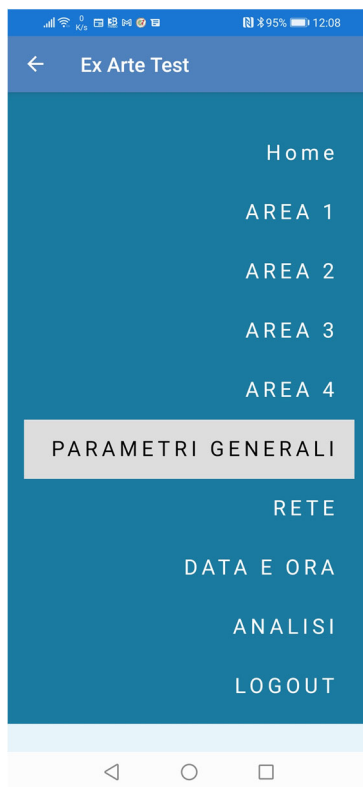
The icon on the left tells whether the controller is connected (green) or disconnected (red) while the icon on the right allows access to the logs of the different areas related to led intensity, temperature, humidity and phase changes.


:

Selecting a particular device, the chance is given to check the state of the areas:



and if needed to change the **LORLights Controller'** configuration through the following curtain menu:



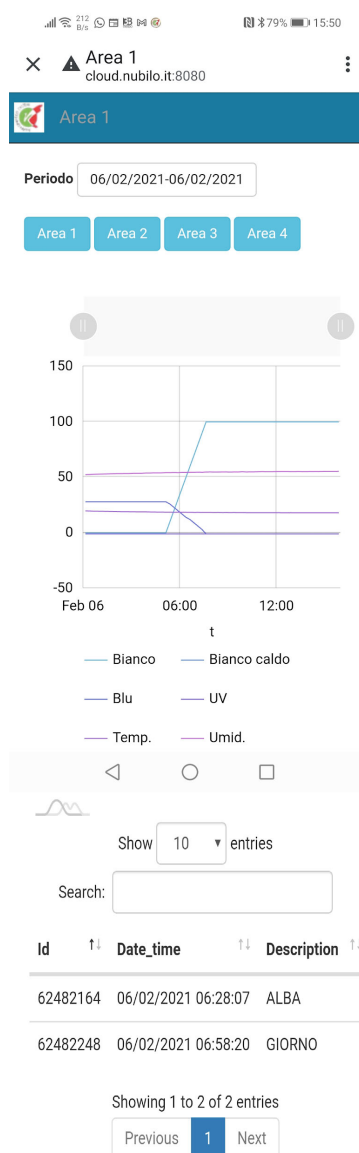
For each device, the icon  allows access to the display of logs.

In the upper side it is possible to select the period and area whose values you want to check.

In the middle, the display shows in a graphic form, the values of led intensity for the chosen period and area.

In the lower side, a table shows when the changes of phase have happened, for the chosen period and area.

The same functionalities as the app, except for the notification in push mode, are available through web app at the address <http://lorlights.nubilo.it:8080>



F.A.Q.

1. Is it possible to use the Controller with any led bar/strip available on the market?

The pilotage used for the led bars is a PWM (Pulse Width Modulation) with a hot common (+12V) for every led and single signals for each kind of led (Ww, Cw, B e UV). Theoretically any kind of compatible led bar.

2. Is it possible to use 24v led bars (using a 24v power supply)?

Yes, **LORLights Controller** admits both 12Vdc and 24Vdc power supply.

3. Is it possible to connect in series more led bars without using the distributors?

The **LORLights LedBars** CANNOT be connected in series, a choice made upon evaluations of safety, reliability and flexibility of the whole system. The connection in series requires all the current to run through the first bars of the system, and this may cause an excessive heating of the conducting tracks of the first bars and of the cables connecting the bars in series if not properly sized. The breakdown or accidental disconnection of a bar causes the turning off of all the bars below.

4. I have got a small farming of about 45 cages, arranged in 3 rows of 15. All the rows follow the same pattern as to the hours of light; as to the intensity of light, the first 2 rows have got the same parameters, whilst the third row has got a different value, because during the preparatory phase I keep the female canaries at a lower intensity than the males in the first 2 rows.

In this case it is necessary to configure 2 different areas, and therefore a **LORLights Extender** is needed in case you are using bars with just two kind of led (White and Blue), it is possible to configure 2 areas directly on the **LORLights Controller**, with no need of the **LORLights Extender** (ref configuration 3 paragraph 8).