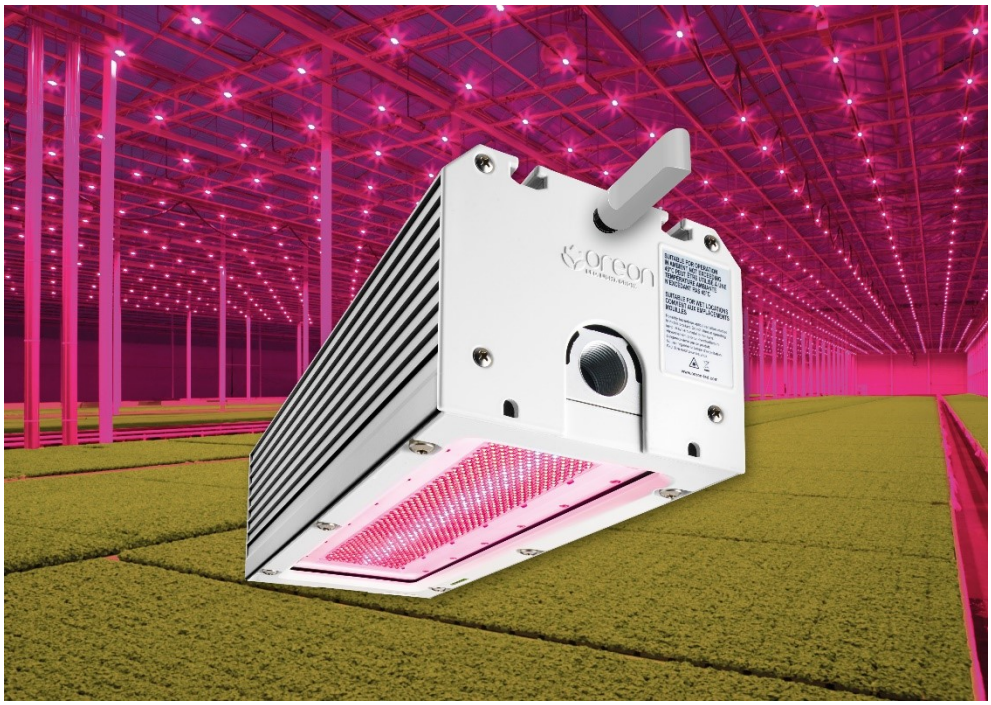


OREON LED CONTROL CENTRE

INSTALLATION GUIDE

V20240521

Oreon
Lorentzlaan 6
3401 MX IJsselstein
The Netherlands

T +31 30 760 0660
E info@oreon-led.com
W www.oreon-led.com

CONTENTS

1. INTRODUCTION

This document provides a description of the Oreon Led Control Center (OLCC in the remainder of this document) and a guideline for its installation, operation and maintenance.

OLCC creates a Bluetooth mesh network within a defined installation of Oreon LED luminaires, enabling wireless two way communication between the luminaires and the climate computer.

Each luminaire within the network can be remotely controlled, either individually or as a part of a larger group. The amount of groups and luminaires per group are practically limitless and can be (re)arranged at any point in time.

OLCC enables a wireless control of the light level throughout the installation (dimming by group with the possibility to set dependencies between groups) and status monitoring of individual luminaires.

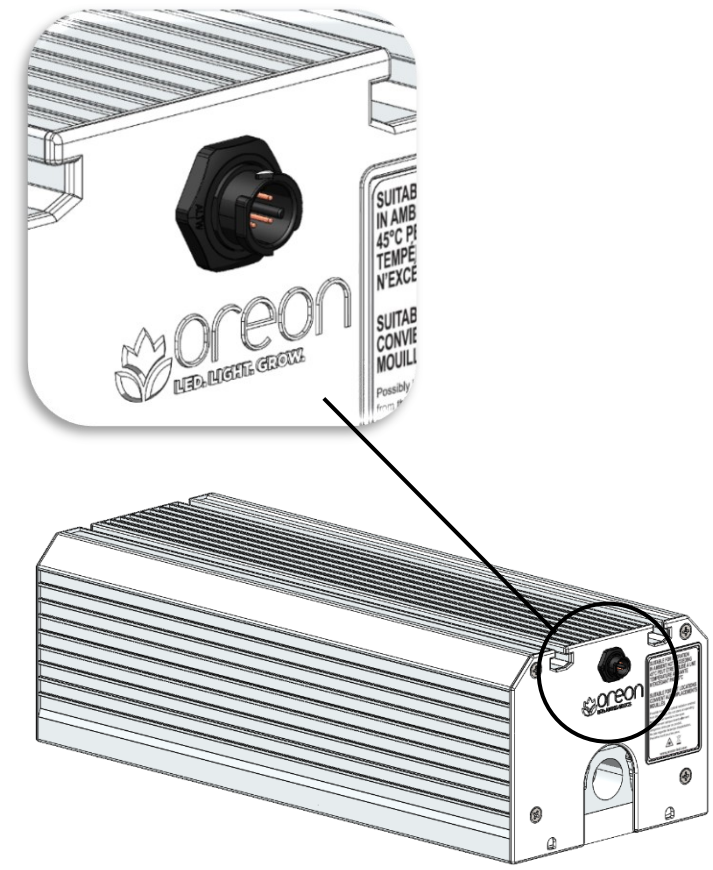
2. SYSTEM DESCRIPTION

OLCC consists of the following elements:

A. OREON dimmable water-cooled LED grow lights
B. OLCC Transceiver Module
C. OLCC Edge Device
D. OLCC External Relay Module
E. OLCC Cloud Software

2.1 OREON DIMMABLE WATER-COOLED LED GROW LIGHTS

OLCC works with the dimmable version of the Empress / Monarch – The Dutch Powerhouse Top-Lighting. These luminaires are visually recognizable by the dim-connector on the end-plate and the E.xxxx.02 or M.xxxx.02 type number format as written on the rating label.

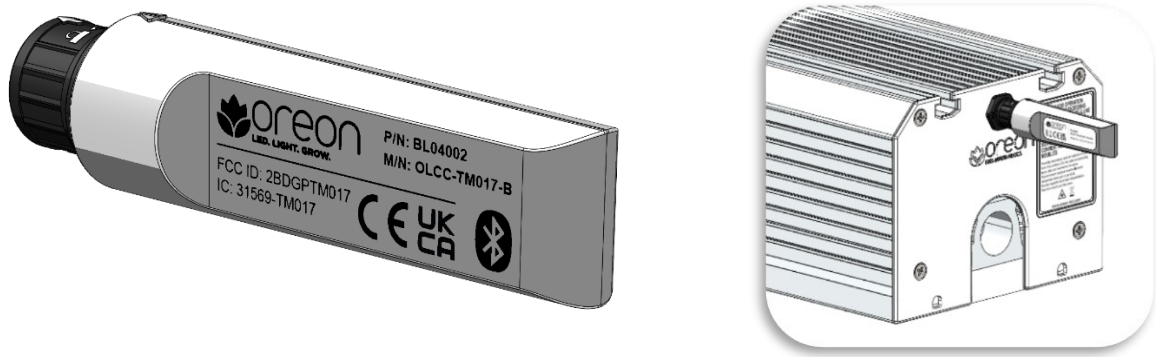


Dim connector

Rating label

2.2 OLCC TRANSCEIVER MODULE

With the installation of the OLCC Transceiver Module a network node is created at each luminaire. By means of these connection points, data can be received and relayed to all neighboring nodes that are within visible range (up to +/- 15 mtr).



Transceiver Module

2.2.1 COMPLIANCE

FCC ID: 2BDGPTM017

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Modifications (FCC 15.21) Changes or modifications to this equipment not expressly approved by Oreon may void the user's authority to operate this equipment.

IC: 31569-TM017

(EN) This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

(F) L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. *L'appareil ne doit pas produire de brouillage;*

2. *L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.*

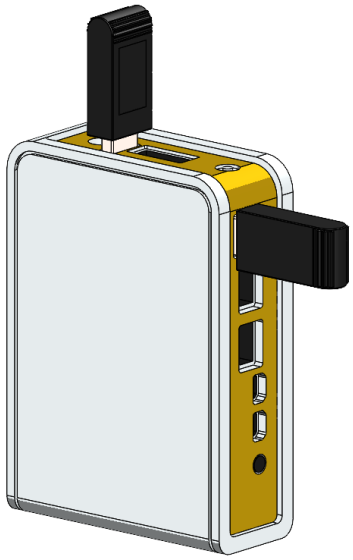
2.2.2 SAFETY

(EN) The calculated RF safe distance for this device is 20 cm. Please keep a separation of at least 20cm whenever the device is in operation.

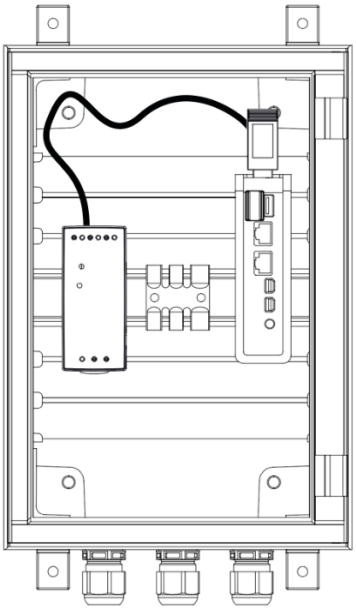
(F) - La distance de sécurité RF calculée pour cet appareil est de 20 cm. Veuillez maintenir une séparation d'au moins 20 cm lorsque l'appareil est en fonctionnement.

2.3 OLCC EDGE DEVICE

The OLCC Edge Device creates the GateWay between the Climate Computer and network of luminaires. It relays commands from the Climate Computer to the nearest luminaires within the network and sends back messages from the luminaires to the Climate Computer. The OLCC Edge Device (OnLogic CL250) is supplied in a pre-assembled Electrical Box.



Edge Device



Electrical Box

2.4 OLCC EXTERNAL RELAY MODULE

Relay of the command signal depends on active nodes, i.e. luminaire is switched on with dimming set between 0 and 100%. Sometimes the smallest distance between two active nodes may become too big for a (reliable) signal transfer. Eg. when one or more (groups of) luminaires within the mesh network are switched off (no power). Or when two or more remote zones of the installation which belong to the same network (controlled by a single Edge Device). In such a case one or more external relay modules can be used to bridge the gap. Each relay module powers an OLCC Transceiver Module.

Example: The luminaires in the schematic (2.6) on page 7 are divided into two groups. If group 1 is inactive, the command signal from the edge device can't directly reach group 2. In this case the external relay module becomes the active node to bridge the gap of group 1.

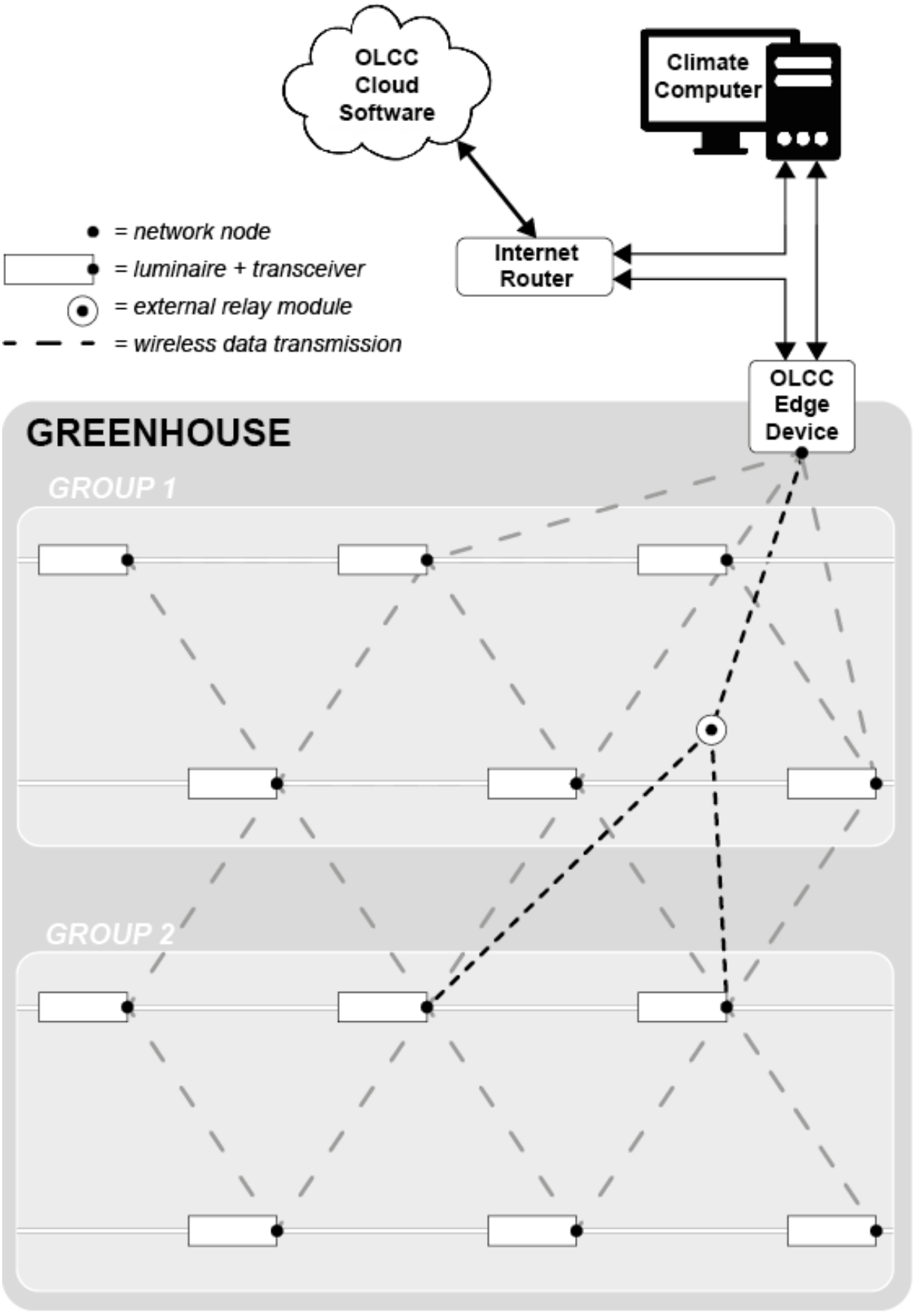
The number of external relay modules, and their relative positioning, is an integral part of the lighting plan (depending on the lay-out of the entire installation of luminaires, grouping and anticipated use).

External Relay Module + Transceiver Module

2.5 OLCC CLOUD SOFTWARE

-- Under construction --

2.6 OLCC SCHEMATIC



3. HARDWARE INSTALLATION

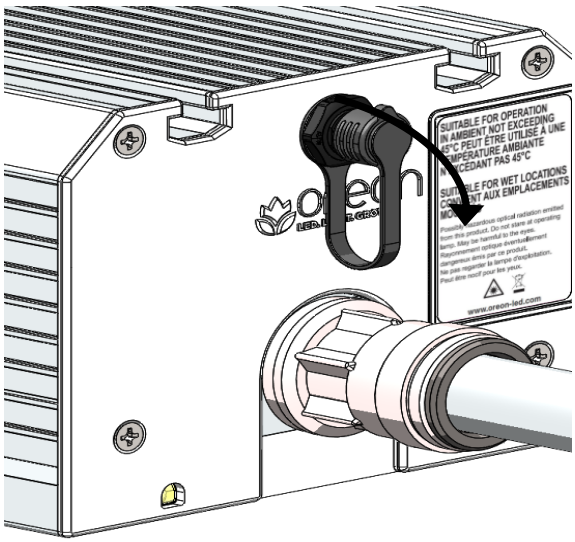
Installation of the dimmable water-cooled led grow lights (including the custom electrical system and water-cooling system) must be performed by a qualified installer according to the lighting plan and latest version of the installation manual (installation-manual-monarch-v20200201m).

NOTE: We recommend to finish the complete installation of luminaires and adjacent systems before proceeding with the installation of the transceiver modules.

3.1 OLCC TRANSCEIVER MODULE

STEP 1 – Removal of the dust cap

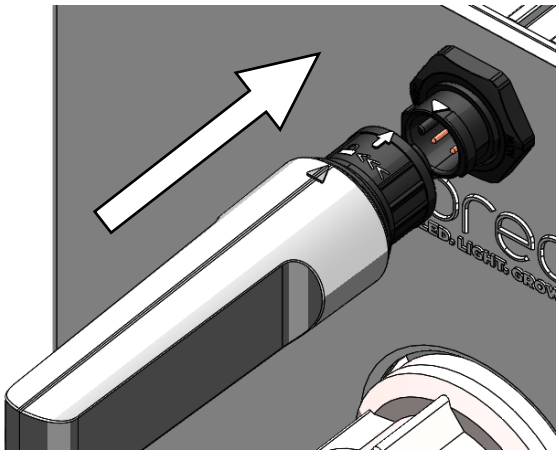
When not in use, the dust cap protects the dim-connector on the luminaire from any ingress of dirt, dust and moisture. Take it off in order to install the transceiver module.



NOTE: We highly recommend to let the luminaire acclimatize in the area of its final installation for at least 24 hours before fitting the transceiver module (to minimize the negative impact of potential condensation).

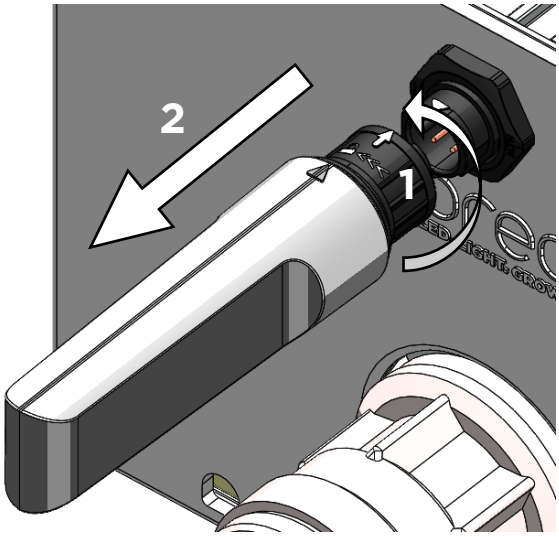
STEP 2 – Installation of the OLCC Transceiver Module

Align the white arrows on the dim-connector and the Transceiver Module. Then push the Transceiver Module fully into the dim-connector, making sure the lock ring snaps back into the aligned position.



Removal of the OLCC Transceiver Module

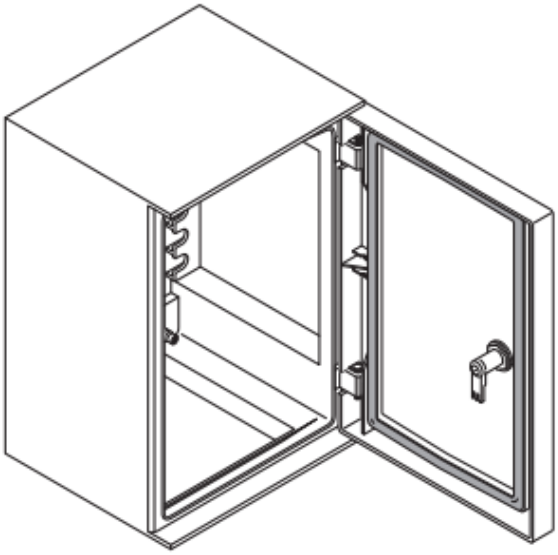
To remove the Transceiver Module, twist the lock ring counter clockwise (1) and pull away (2) from the luminaire.

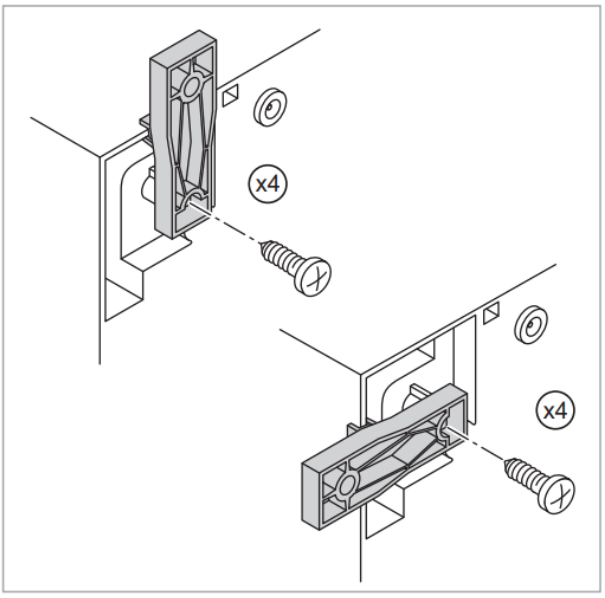


3.2 EDGE DEVICE

The electrical box with the Edge Device must be installed in the greenhouse or growing area, as close as possible to the nearest luminaire (at least within a distance of 10 meters, preferably with a clear line of sight).

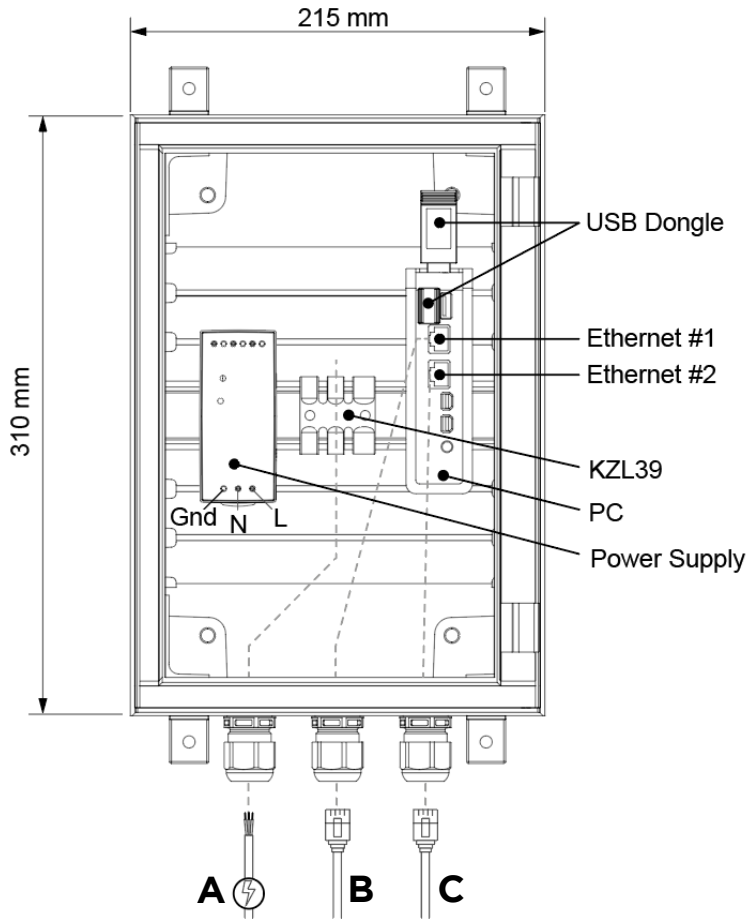
Install the electrical box vertically to a stable surface and mount with the supplied brackets. Use suitable screws and/or wall plugs (not supplied).





The Edge Device requires three connections:

A. AC Electric Power (100~240V, 50-60Hz)
B. Ethernet #1 → Climate Computer
C. Ethernet #2 → Internet



Before proceeding make sure the mains power is switched off!

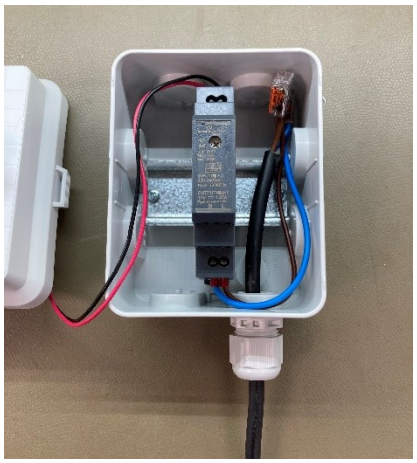
1. Feed each of the mains and ethernet cables into the electrical box through one of the three cable glands at bottom.
2. From the mains cable connect “Line” (Brown), “Neutral” (Blue) and “Ground” (Green/Yellow) to the corresponding terminals of the Power Supply (12V).
3. Provide a strain relief to the power cable by strapping it to KZL39 with a cable tie.
4. Connect both Ethernet cables to the dedicated ports (no specific order) of the Edge Device.
5. Tighten the cable glands.
6. Check that both USB Dongles are plugged in correctly.
7. Mains power may be switched back on from this point.

3.3 EXTERNAL RELAY MODULE

1. Mount the relay module (junction box) vertically with the cable gland fitted at the bottom. To access the screw holes within the junction box, slide the internal power supply (12V) to the side within the box or temporarily take it out.

Before proceeding make sure the mains power is switched off!

2. Feed the mains power cable (100-240V) through the cable gland and connect line (brown wire) and neutral (blue wire).



3. Close the lid of the junction box and make sure no wires get jammed. Mains power may be switched back on from this point.

4. Remove the dust cap from the connector and plug in an OLCC Transceiver Module.

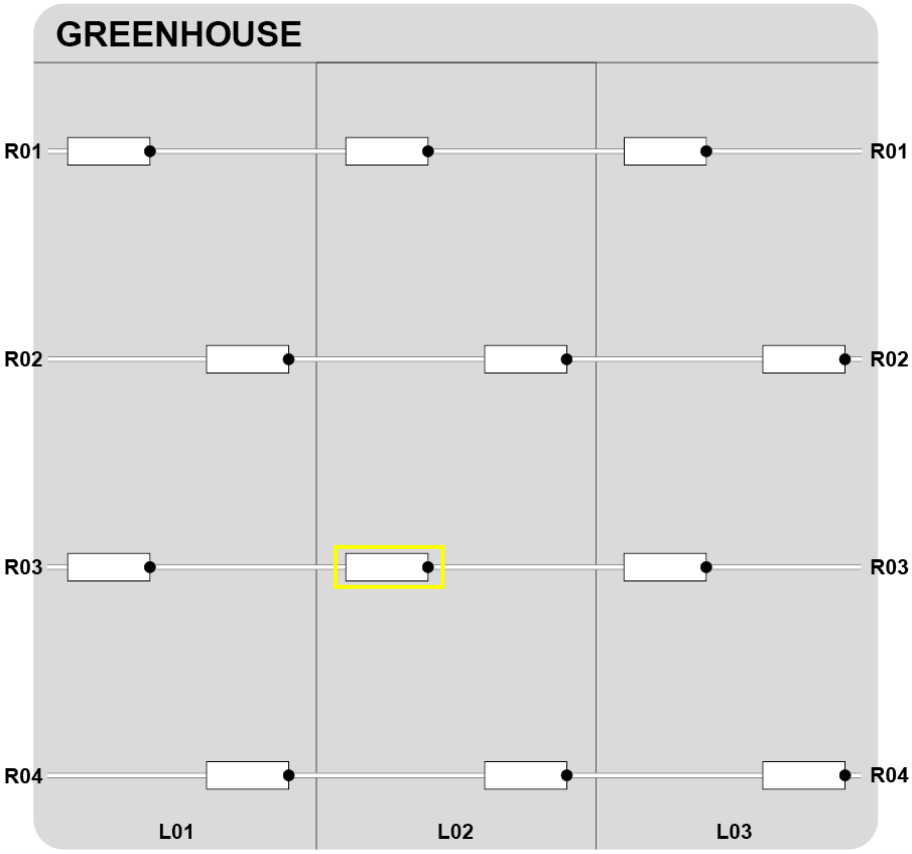
4.COMMISSIONING

In order to effectively use the OLCC Control Software it's necessary to exactly know the position of the luminaires in the greenhouse. Each luminaire has to be identified and assigned to a specified location.

4.1 LOCALIZATION

As specified by the lighting plan, all luminaires are installed at a certain (relative) position within the greenhouse. To accurately define these locations, the position of all luminaires are translated into a "Grid". In this grid every row "R-xx" represents a waterline, each with N number of luminaires. In the columns "L-xx" are the luminaires with the same relative position on each row. The number of rows and columns depend on the size and lay-out of the greenhouse.

In the example below there's a total of 12 luminaires, divided into 4 rows (R01 - R04) with 3 luminaires each (L01 – L03). The grid location of the highlighted luminaire therewith is R03_L02.



Grid Location

4.2 IDENTIFICATION

Oreon grow lights can be identified by their unique serial number, which is printed on the rating label. With Oreon Top Lighting the rating label is applied on the end plate with the power supply connector.

The data matrix on the rating label can be read by any suitable 2D scanning device and returns the ID (type number + serial number) of the luminaire. In below example this result will be M.AAFM.02 D2245 0175.

Serial Number & Data Matrix

Rating label TopLight

4.3 MAPPING

Mapping of the entire installation is done by collecting the ID and location of each luminaire into a dedicated spreadsheet. This MS Excel-file is provided by Oreon and will be tailored for each installation project (matching the lay-out of the lighting plan and listing all Grid Locations).

Within the spreadsheet-file there are 4 separate worksheets:

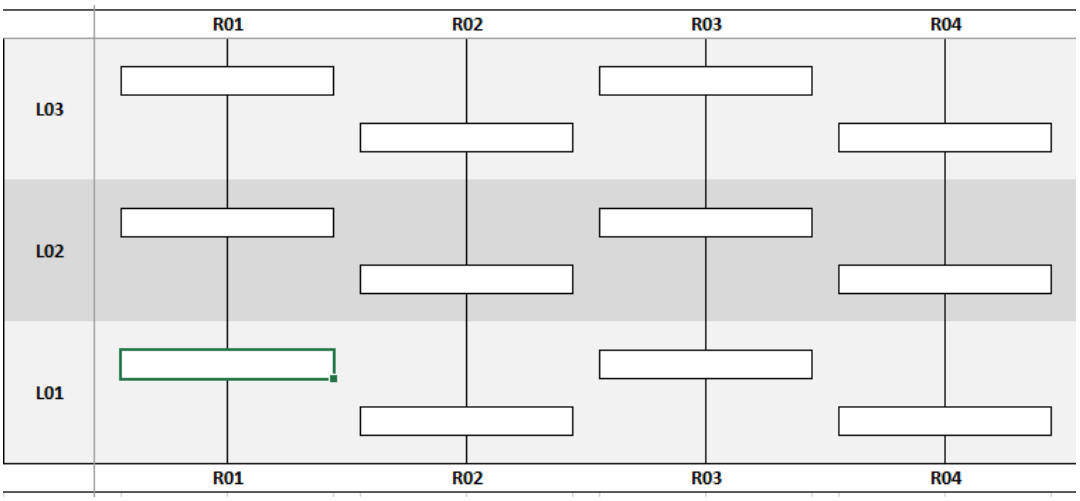
1. Sheet “INPUT - Linear”
2. Sheet “INPUT - Grid”
3. Sheet “MAP”
4. Sheet ”UPLOAD

4.3.1 INPUT

The “Input” worksheets are dedicated for entering the luminaire ID / Serial Number and come in two different formats, “Linear” and “Grid”. Both formats can be used and further processing of the entered data is done the same way.

Row #	Lamp #	Location	Serial Number
R01	L01	R01_L01	
R01	L02	R01_L02	
R01	L03	R01_L03	
R01	L04	R01_L04	
R02	L01	R02_L01	
R02	L02	R02_L02	
R02	L03	R02_L03	
R02	L04	R02_L04	
R03	L01	R03_L01	
R03	L02	R03_L02	
R03	L03	R03_L03	
R03	L04	R03_L04	

Input sheet “Linear”



Input sheet “Grid”

Besides personal preference, the format of choice will depend on the type of barcode scanner and input device which is used (laptop, tablet or smartphone) for entering the luminaire ID’s.

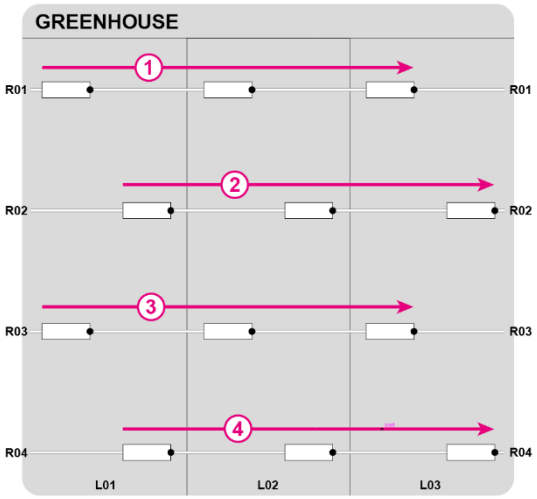
Oreon has tested and approved the “Netum C750 Wireless Barcode Scanner” for this application (see Appendix A for a summary of the essential functionalities).

Linear-format works best with the wireless 2D-scanner connected to a laptop PC:

- Connection of the scanner to the laptop by dongle (2,4GHz) or Bluetooth
- Enter the scanned luminaire ID directly into the Input sheet or use Wireless 2D Scanner in "Offline Mode". When using "Direct Mode" the laptop must be within range of the wireless scanner (10~15 mtr for Bluetooth, 30~50 mtr for 2,4 GHz dongle)
- Enable "Carriage Return" to automatically move the cursor (downward) to the next cell after each data entry. This feature must be enabled when the input device is out of arm's reach (not possible to manually select next cell) and/or with the wireless scanner in "Offline Mode".
  (NOTE: terminating character suffix not supported by Excel App for Mobile),
- Use the "filter / sorting" option to match the order of the "Location column" with the scanning sequence.

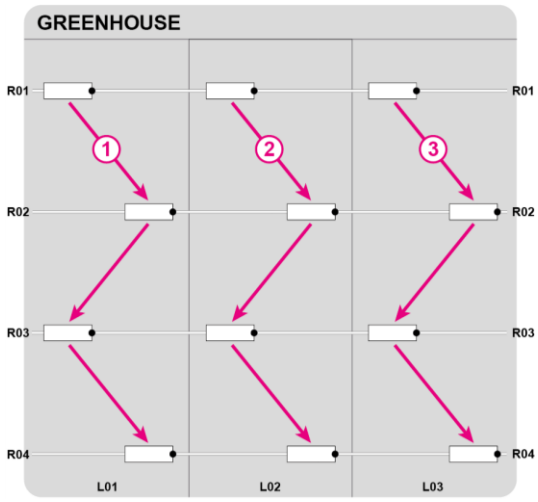
Scanning sequence by single Row #

Row #	Lamp #	Location	Serial Number
R01	L01	R01_L01	M.AAFM.02 D2245 0175
R01	L02	R01_L02	M.AAFM.02 D2245 0176
R01	L03	R01_L03	M.AAFM.02 D2245 0177
R02	L01	R02_L01	M.AAFM.02 D2245 0178
R02	L02	R02_L02	M.AAFM.02 D2245 0179
R02	L03	R02_L03	M.AAFM.02 D2245 0180
R03	L01	R03_L01	M.AAFM.02 D2245 0181
R03	L02	R03_L02	M.AAFM.02 D2245 0182
R03	L03	R03_L03	M.AAFM.02 D2245 0183
R04	L01	R04_L01	M.AAFM.02 D2245 0184
R04	L02	R04_L02	M.AAFM.02 D2245 0185
R04	L03	R04_L03	M.AAFM.02 D2245 0186



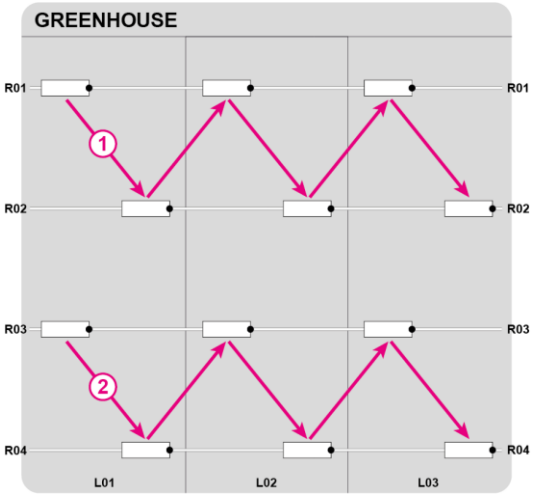
Scanning sequence by single Lamp #

Row #	Lamp #	Location	Serial Number
R01	L01	R01_L01	M.AAFM.02 D2245 0175
R02	L01	R02_L01	M.AAFM.02 D2245 0178
R03	L01	R03_L01	M.AAFM.02 D2245 0181
R04	L01	R04_L01	M.AAFM.02 D2245 0184
R01	L02	R01_L02	M.AAFM.02 D2245 0176
R02	L02	R02_L02	M.AAFM.02 D2245 0179
R03	L02	R03_L02	M.AAFM.02 D2245 0182
R04	L02	R04_L02	M.AAFM.02 D2245 0185
R01	L03	R01_L03	M.AAFM.02 D2245 0177
R02	L03	R02_L03	M.AAFM.02 D2245 0180
R03	L03	R03_L03	M.AAFM.02 D2245 0183
R04	L03	R04_L03	M.AAFM.02 D2245 0186



Scanning sequence by multiple Row #

Row #	Lamp #	Location	Serial Number
R01	L01	R01_L01	M.AAFM.02 D2245 0175
R02	L01	R02_L01	M.AAFM.02 D2245 0178
R01	L02	R01_L02	M.AAFM.02 D2245 0176
R02	L02	R02_L02	M.AAFM.02 D2245 0179
R01	L03	R01_L03	M.AAFM.02 D2245 0177
R02	L03	R02_L03	M.AAFM.02 D2245 0180
R03	L01	R03_L01	M.AAFM.02 D2245 0181
R04	L01	R04_L01	M.AAFM.02 D2245 0184
R03	L02	R03_L02	M.AAFM.02 D2245 0182
R04	L02	R04_L02	M.AAFM.02 D2245 0185
R03	L03	R03_L03	M.AAFM.02 D2245 0183
R04	L03	R04_L03	M.AAFM.02 D2245 0186

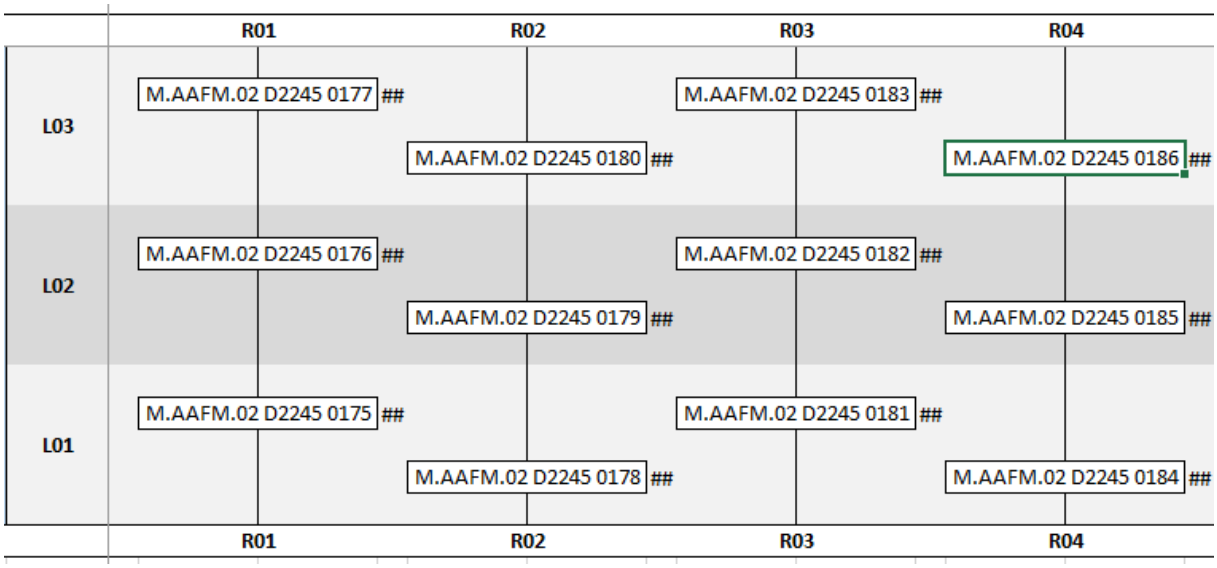


NOTE: Scanning method with a remote input device requires an accurate working procedure. As there's no immediate on-screen feedback of the scanned result any mistakes (eg. accidentally skipping luminaires or scanning the same luminaire twice) might not be directly noticed.

Grid-format is recommended when using tablet or smartphone as the input device:

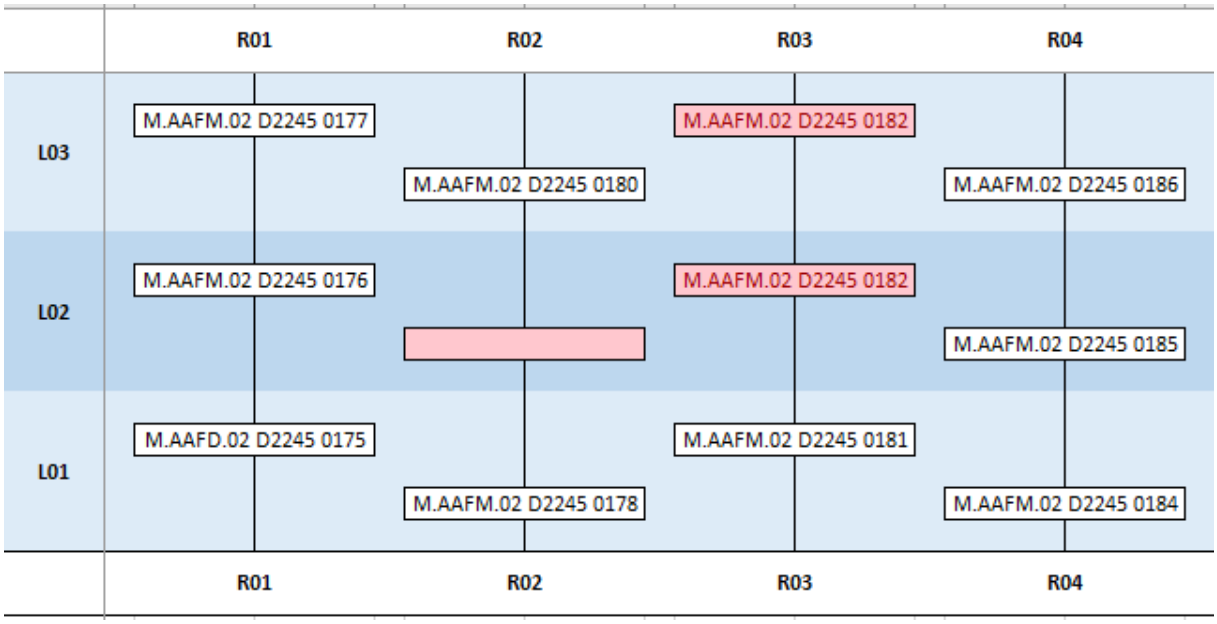
- Connection of the scanner to the input device by Bluetooth
- Direct entry of the luminaire ID into the input sheet (no "Offline Mode")
- Manual selection of the next cell for data entry (carriage return disabled)

The arrangement of the "Grid"-format is matching with the lay-out of the lighting plan. Direct visual feedback (on-screen) of the scanned result allows for more flexibility with regard to the working sequence throughout the installation.



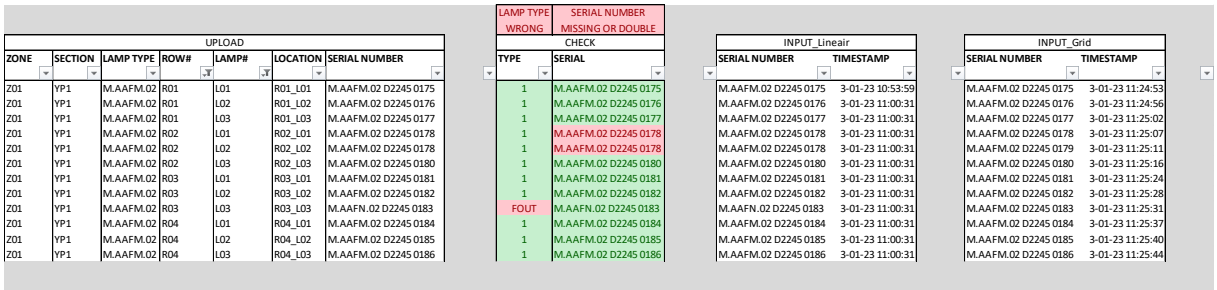
4.3.2 MAP

The “MAP” worksheet has the same lay-out as the “INPUT-Grid” worksheet and lists all entered luminaire ID’s from both INPUT-sheets. The main purpose of this worksheet is providing a (visual) reference for the scanning route of the remaining luminaires, especially when using the “Linear” Input-format. In addition it offers a possibility to check for potentially missed luminaires and/or duplicate luminaire ID’s (for example when luminaire is scanned twice). Empty cells or cells with identical data are both marked red.



4.3.3 UPLOAD

Data from the INPUT-worksheets is collected in the UPLOAD-worksheet (Input from Linear-format overruling Grid-format).



UPLOAD						
ZONE	SECTION	LAMP TYPE	ROW#	LAMP#	LOCATION	SERIAL NUMBER
Z01	YP1	M.AAFM.02	R01	L01	R01_L01	M.AAFM.02 D2245 0175
Z01	YP1	M.AAFM.02	R01	L02	R01_L02	M.AAFM.02 D2245 0176
Z01	YP1	M.AAFM.02	R01	L03	R01_L03	M.AAFM.02 D2245 0177
Z01	YP1	M.AAFM.02	R02	L01	R02_L01	M.AAFM.02 D2245 0178
Z01	YP1	M.AAFM.02	R02	L02	R02_L02	M.AAFM.02 D2245 0178
Z01	YP1	M.AAFM.02	R02	L03	R02_L03	M.AAFM.02 D2245 0180
Z01	YP1	M.AAFM.02	R03	L01	R03_L01	M.AAFM.02 D2245 0181
Z01	YP1	M.AAFM.02	R03	L02	R03_L02	M.AAFM.02 D2245 0182
Z01	YP1	M.AAFM.02	R03	L03	R03_L03	M.AAFN.02 D2245 0183
Z01	YP1	M.AAFM.02	R04	L01	R04_L01	M.AAFM.02 D2245 0184
Z01	YP1	M.AAFM.02	R04	L02	R04_L02	M.AAFM.02 D2245 0185
Z01	YP1	M.AAFM.02	R04	L03	R04_L03	M.AAFM.02 D2245 0186

LAMP TYPE WRONG	SERIAL NUMBER MISSING OR DOUBLE
CHECK	
TYPE	SERIAL
1	M.AAFM.02 D2245 0175
1	M.AAFM.02 D2245 0176
1	M.AAFM.02 D2245 0177
1	M.AAFM.02 D2245 0178
1	M.AAFM.02 D2245 0178
1	M.AAFM.02 D2245 0180
1	M.AAFM.02 D2245 0181
1	M.AAFM.02 D2245 0182
FOUT	M.AAFN.02 D2245 0183
1	M.AAFM.02 D2245 0184
1	M.AAFM.02 D2245 0185
1	M.AAFM.02 D2245 0186

INPUT_Lineair	
SERIAL NUMBER	TIMESTAMP
M.AAFM.02 D2245 0175	3-01-23 10:53:59
M.AAFM.02 D2245 0176	3-01-23 11:00:31
M.AAFM.02 D2245 0177	3-01-23 11:00:31
M.AAFM.02 D2245 0178	3-01-23 11:00:31
M.AAFM.02 D2245 0178	3-01-23 11:00:31
M.AAFM.02 D2245 0180	3-01-23 11:00:31
M.AAFM.02 D2245 0181	3-01-23 11:00:31
M.AAFM.02 D2245 0182	3-01-23 11:00:31
M.AAFN.02 D2245 0183	3-01-23 11:00:31
M.AAFM.02 D2245 0184	3-01-23 11:00:31
M.AAFM.02 D2245 0185	3-01-23 11:00:31
M.AAFM.02 D2245 0186	3-01-23 11:00:31

INPUT_Grid	
SERIAL NUMBER	TIMESTAMP
M.AAFM.02 D2245 0175	3-01-23 11:24:53
M.AAFM.02 D2245 0176	3-01-23 11:24:56
M.AAFM.02 D2245 0177	3-01-23 11:25:02
M.AAFM.02 D2245 0178	3-01-23 11:25:07
M.AAFM.02 D2245 0179	3-01-23 11:25:11
M.AAFM.02 D2245 0180	3-01-23 11:25:16
M.AAFM.02 D2245 0181	3-01-23 11:25:24
M.AAFM.02 D2245 0182	3-01-23 11:25:28
M.AAFM.02 D2245 0183	3-01-23 11:25:31
M.AAFM.02 D2245 0184	3-01-23 11:25:37
M.AAFM.02 D2245 0185	3-01-23 11:25:40
M.AAFM.02 D2245 0186	3-01-23 11:25:44

In the “CHECK”-section non-matching lamp types and duplicate luminaire ID’s are marked red.

Data in the “UPLOAD”-section will be uploaded into the Control Software.

5. SOFTWARE CONTROL

-- Under construction –

5.1 OVERVIEW AND TERMS

5.2 SOFTWARE INSTALLATION & CONFIGURATION

5.3 LIGHT GROUPS

5.4 TREATMENTS

5.5 SCHEDULES

5.6 DIRECT CONTROL

5.7 ADVANCED CONTROL

6. TROUBLESHOOTING

-- Under construction –

7. CONTACT INFORMATION

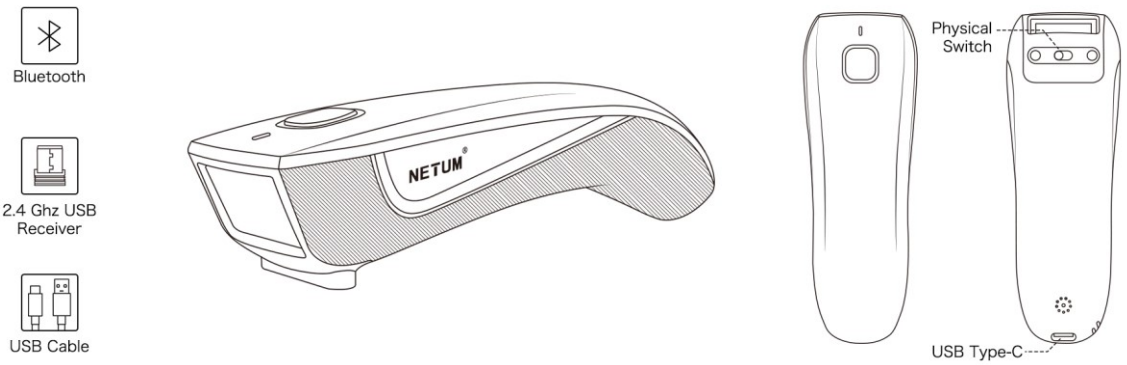
-- Under construction –

APPENDIX A – Netum C750 manual (excerpt)

NOTE: This section only covers the essential functionalities of the wireless barcode scanner, necessary for the commissioning procedure of the OLCC installation.

For a full description of the Netum C750 Wireless Barcode Scanner, please refer to "C750 Full Manual" available on Barcode Scanner User Manuals – NETUM

SCANNER SETUP GUIDE



Barcode Programming

Netum barcode scanners are factory programmed for the most common terminal and communications settings. If you need to change these settings, programming is accomplished by scanning the bar codes in this guide. An asterisk (*) next to an option indicates the default setting.

Important Notes: Many of the command barcodes only work with a scanner in a particular connection modes. Bluetooth or 2.4Ghz wireless mode as indicated by the header row of each table.

CONNECTING SCANNER TO INPUT DEVICE

Working via USB Cable

1. Connect scanner with your device via USB cable.
2. If you use US keyboard, it's plug and play. If you use other type of keyboard , please refer to "keyboardlanguage" to configure the keyboard language before you use it.
3. Locate the cursor on the place where you want the data to be displayed then you can start to scan.

Working via 2.4G receiver

1. Get Started: Scan command barcode of "RF 2.4Ghz Wireless Transmit".
2. Plug the USB receiver on your computer.
3. If you use US keyboard, it's plug and play. If you use other type of keyboard , please refer to "keyboardlanguage" to configure the keyboard language before use it.
4. Locate the cursor on the place where you want the data to be displayed then you can start to scan.

%#IFSNO$1

*RF 2.4Ghz Wireless Transmit

Working via Bluetooth

1. Scan command barcode of" Working via Bluetooth"
2. Pair the bluetooth.(refer to the “bluetooth pairing” on the next page).
3. Set keyboard language. US Keyboard by default if you use other types of keyboard please configure keyboard language before you use it.
4. Locate cursor on the place where you want the data to be displayed then you can start to scan.

%#IFSNO$4

Working via Bluetooth

BLUETOOTH CONNECTION

Android

Connect Android Device

1. Power on the scanner. The LED light will be flashing.
2. Touch Home | Menu | Settings | Wireless & Networks | Bluetooth settings
3. Make sure the device has Bluetooth "On".
4. In the list of found devices, select "Netum Bluetooth". Tap Pair.
5. The scanner will make one long beep after bluetooth paired and LED light will turn to solid blue (no blinking).

Apple

Connect Apple iOS Device

1. Power on the scanner. Blue LED light will start to flash.
2. Start a Bluetooth device search. IOS: Tap Settings | General| Bluetooth. Turn on. A Bluetooth device search will begin.
3. In the device list, tap on "Netum Bluetooth". Tap Pair.
4. The scanner will make one beep once it's connected and LED light will turn to solid blue (no blinking) and is ready to scan.

Windows

Connect Windows PC

1. Power on the scanner. Make sure the scanner is discoverable (unpaired).
2. Use your computer's Bluetooth Settings to connect to the scanner.
3. Open Devices and Printers and select "Add a device".
4. In the device list, select "Netum Bluetooth". Click Next.
5. Follow the remaining screens to complete the wizard.
6. The scanner will make one beep once it's connected and LED light will turn to solid blue (no blinking) and is ready to scan.

NOTE Default Idle Time:

Scanner will power off automatically if device is not connected within 1min.

DATA UPLOADING MODE

If you are heading for a working area which lies outside the Bluetooth signal range, you may activate scanner's store mode, following steps described below. Under this mode, all scanned data will be stored directly into the buffer memory of the device. Furthermore, the data entries will be permanently saved in the buffer memory prior to the manual upload into the working station, so that you may upload them when you are near your working device.

Quit Offline Mode

By scanning the following barcode, the device leaves the offline mode, normal mode will be reinitialized.

*Quit Offline Mode

Offline Mode

By scanning the following barcode, the offline mode will be activated.

Offline Mode

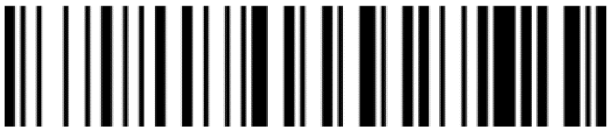
Output Stored Data

By scanning the following barcode, all data entries in the buffer memory can be manually uploaded after reconnecting to the working station.

Output Stored Data

Clear Memory

By scanning the following barcode, all data in the buffer memory will be deleted.



Clear Memory

TERMINATOR

The scanner provides a shortcut for setting the terminating character suffix to CR or CRLF and enabling it by scanning the appropriate barcode below.

None

CR&LF *

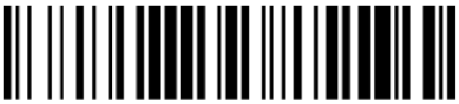
CR

TAB

MISCELLANEOUS

Beeper

Enable/Disable scanner to beep to indicate successful scan.



$BUZZ#0

BEEP OFF

$BUZZ#1

*High Volume

$BUZZ#2

Middle Volume

$BUZZ#3

Low Volume

Get Battery Volume

Scan below command barcode to get battery rough volume

%BAT_VOL#

Battery Rough Volume

Restore factory default

Scanning the following 4 barcodes one by one to restore the scanner to factory defaults.

1)

2)

3)

4)