



# **NODER PARKING SYSTEM**

Parking space occupancy detection system

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## **1. Protection**

Read this instruction before installing this product. The manufacturer is not responsible for any malfunction or damage to the equipment resulting from failure to follow the instructions. Damage caused by incorrect installation, maintenance or operation is not covered by the warranty. Making any changes to the unit that are not authorised by the manufacturer or carrying out independent repairs will result in the loss of rights under the warranty. Installation should be carried out by a person with appropriate electrical authorization.

## **2. Warning**

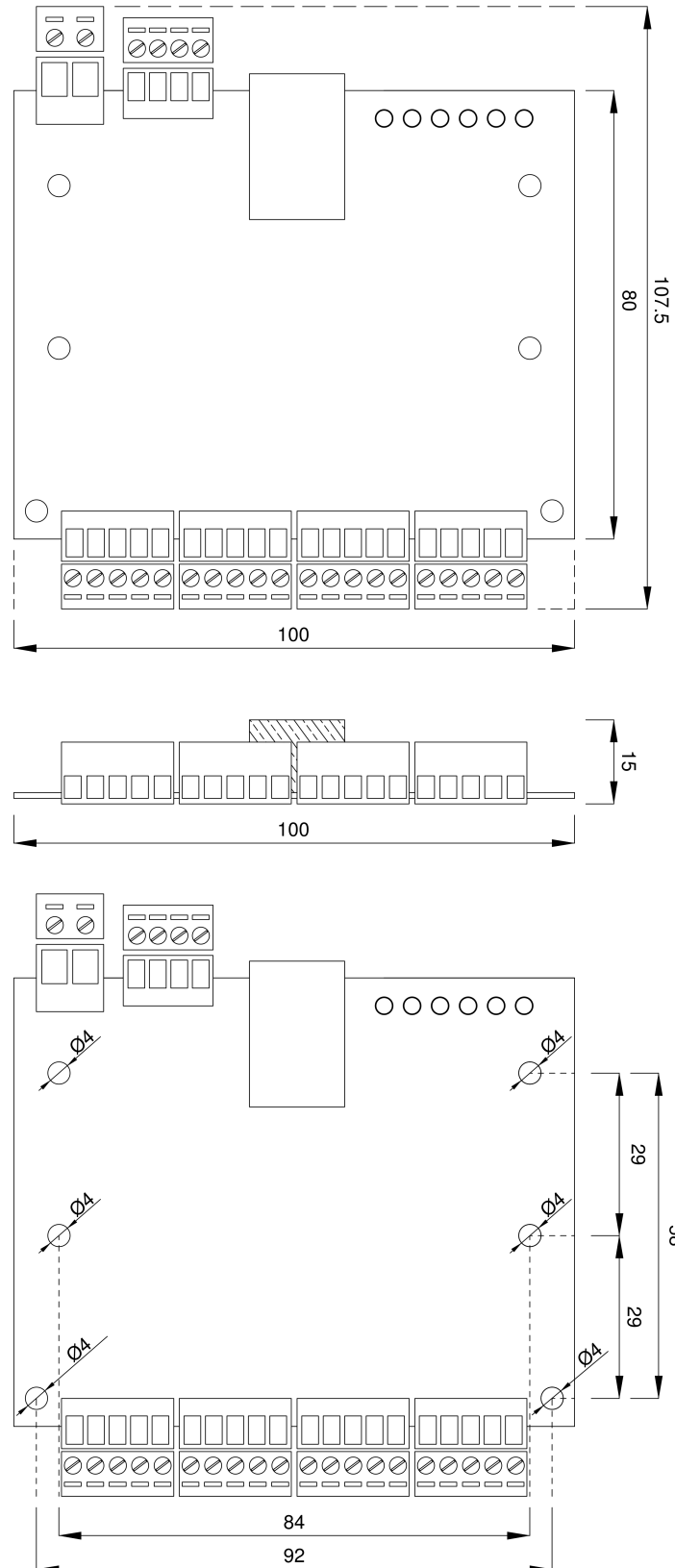
Electric device under voltage! Before performing any activities related to the power supply (connecting wires, installing the device, etc.), make sure that this device is not connected to the power supply. During installation, discharge your electrostatic charge by touching a grounded component each time before installation to avoid voltage surges. The installation should be carried out by a person with the appropriate electrical license.

## **3. Device description**

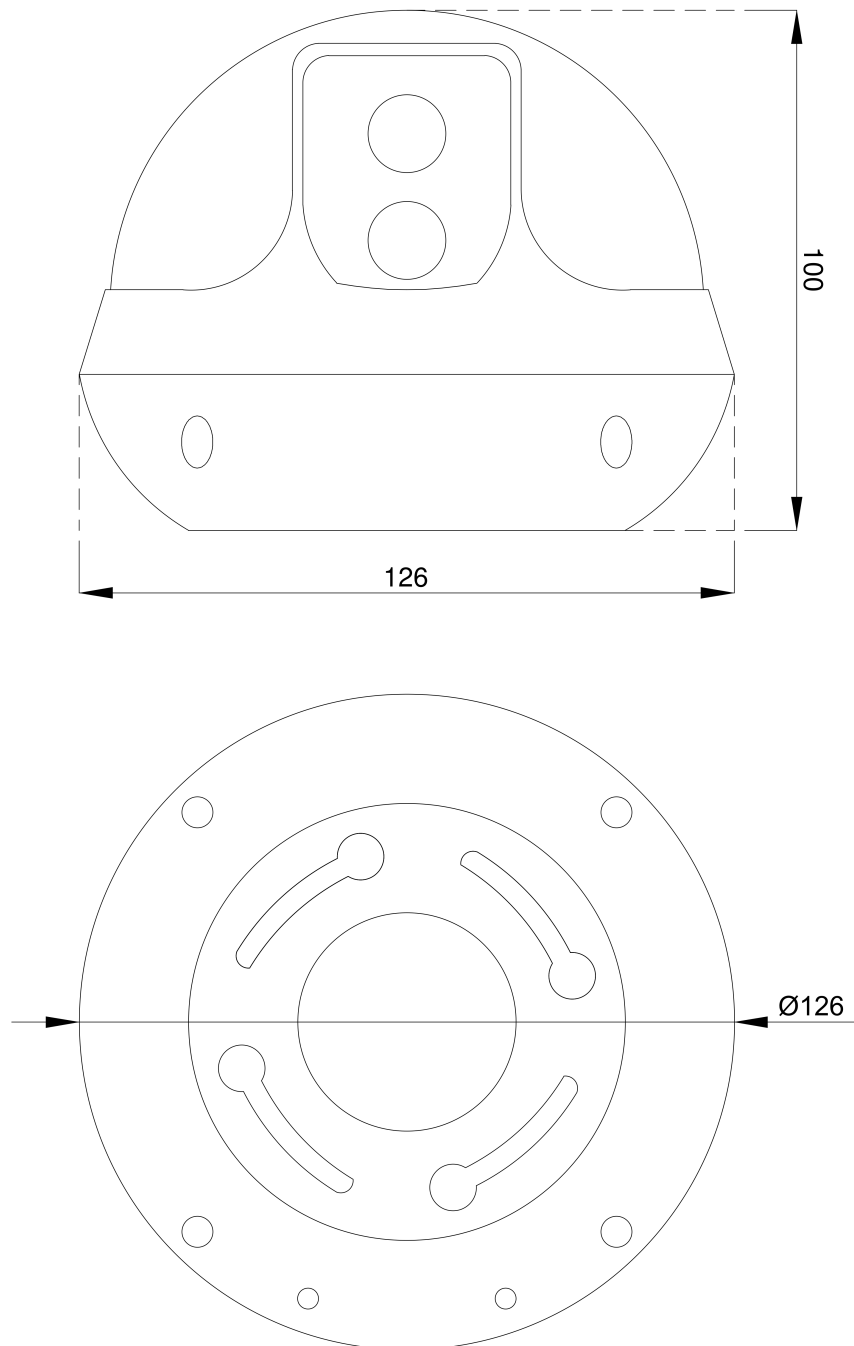
The NODER parking space occupancy detection system is based on integrated ultrasonic sensors with visual signaling and IP concentrators. The sensors, mounted above each parking space, make it possible to unequivocally determine the presence of a given vehicle and inform about the status of a given parking space (free or occupied). The sensor uses ultrasonic technology to detect the status of a parking space, and then controls the LED accordingly to display the correct color and let the driver know where the available space is. The sensors are connected to each other in groups using devices, called hubs. Each hub operates the sensors via four independent RS-485 buses, and the hub allows the sensors to exchange data directly with the integrated platform via TCP/IP protocol.

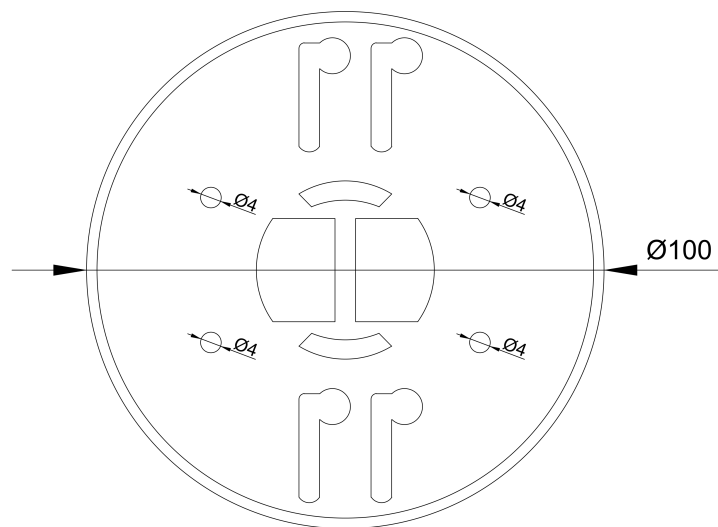
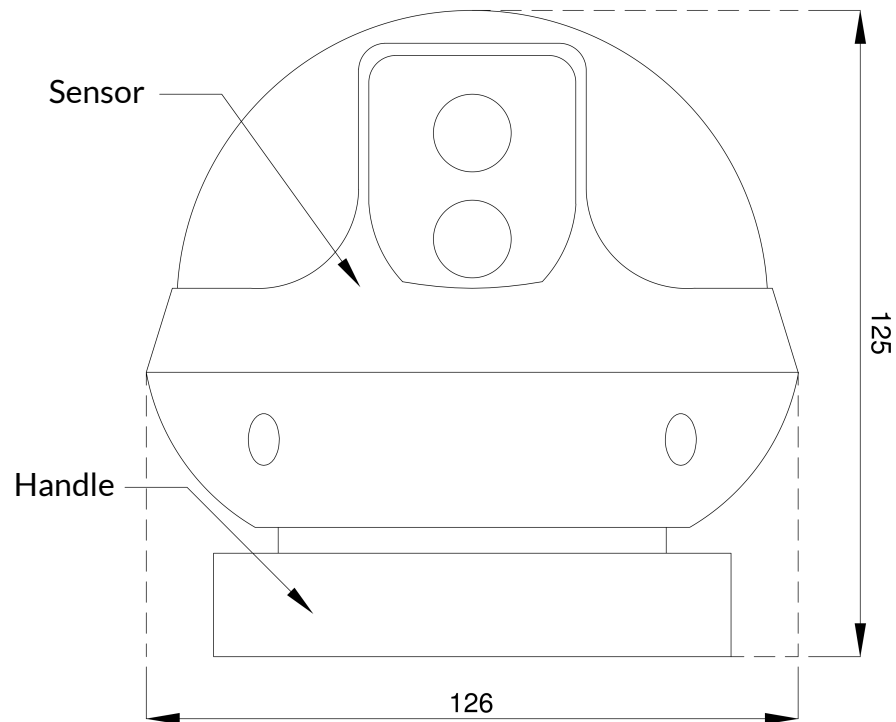
## 4. Device dimensions

### 4.1 CONC-4RS485 Controller

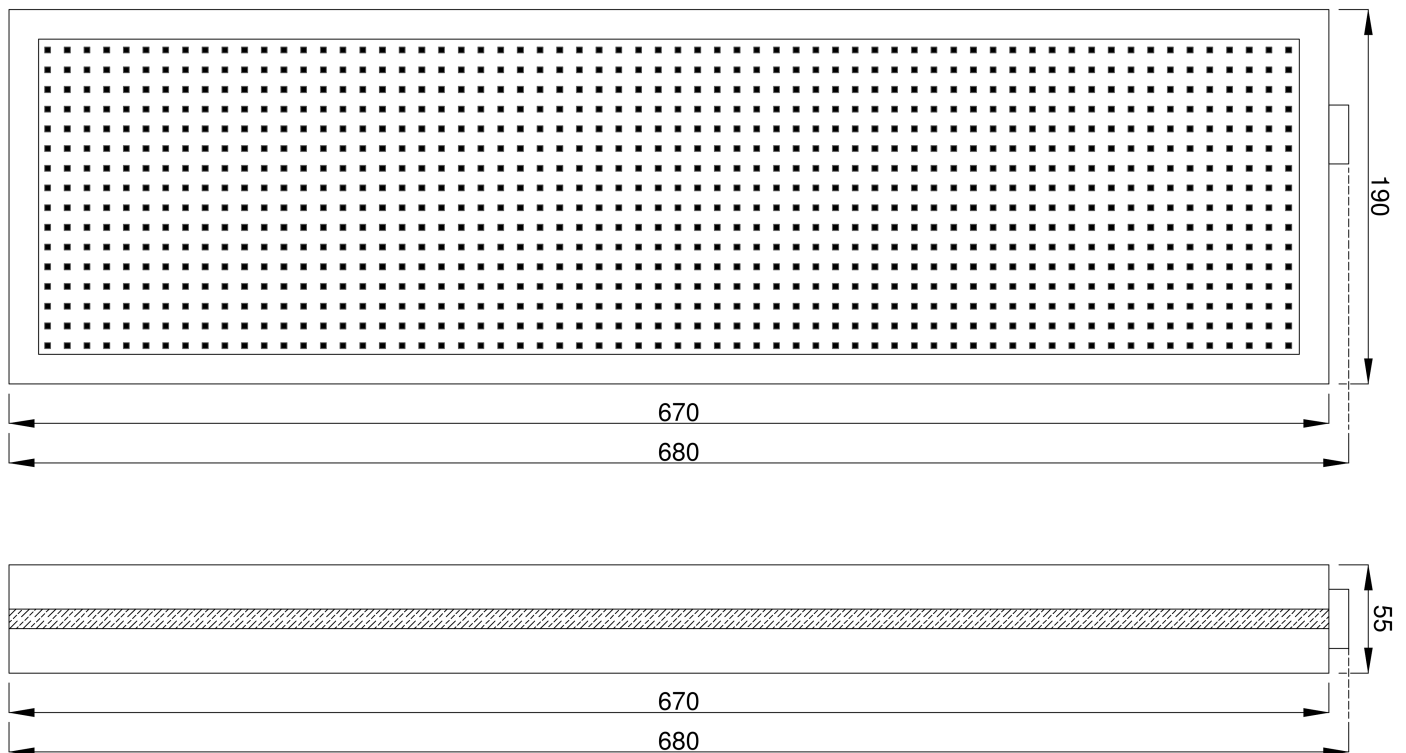


## 4.2 IUPS-R Parking Space Sensor





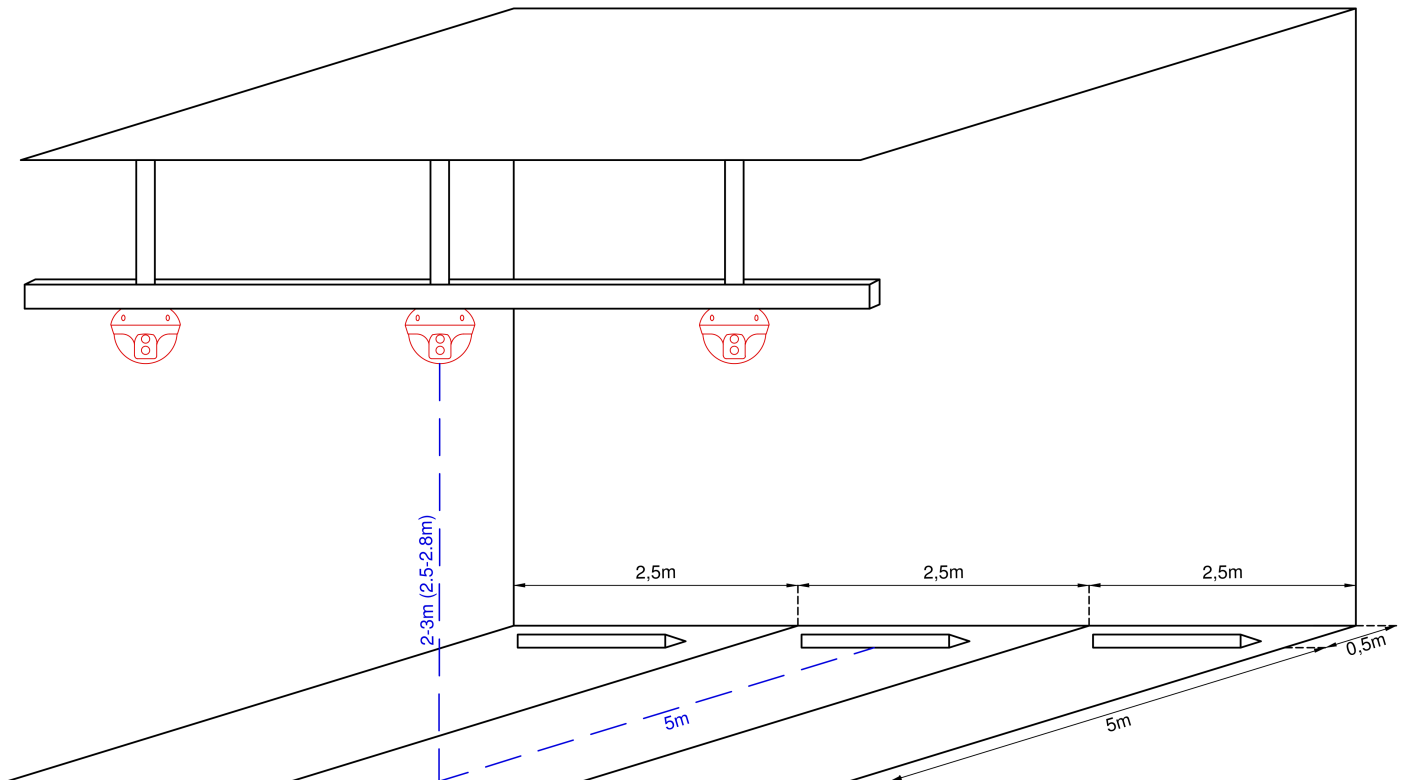
### 4.3 LDO-1 Parking RGB LED Dynamic Display



## 5. Positioning of the NODER IUPS-R sensor

The diagram below shows an example of how a sensor can be installed at a 2.5x5m parking space. The height range for a correct reading of parking space occupancy is 2-3m. **However, the recommended installation height is 2.5-2.8m.** The sensor should be installed in the centre of each parking space at a distance of 4.5-5m from the end of the space. Attention should be paid to the distance between the parking space and walls or pillars, which should be a minimum of 0.5 m. This area should not be included in the length of the parking space when installing the sensor. A cable tray with a minimum width of 10cm is required for correct installation. **The cable tray must be fixed rigidly to the ceiling and must not be able to swing.** It is best to use factory made patchcords of approximately 3m length to interconnect the sensors.

Position the sensor in relation to the parking space:

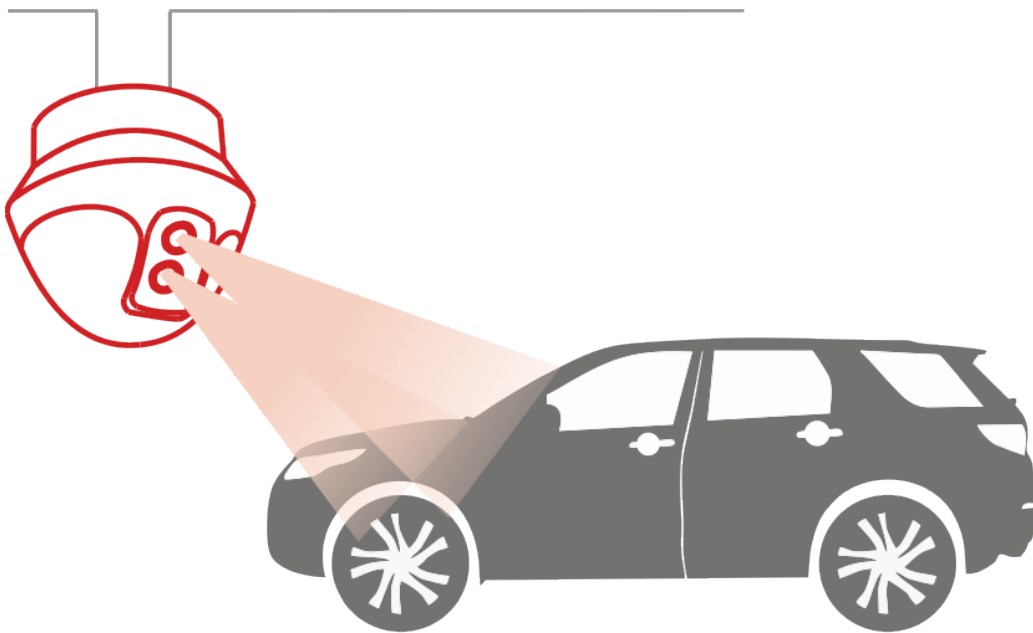




Combination of further sensors in a single line over parking spaces:



For a correct reading, the sensor should be positioned in the centre of the parking space to avoid false readings from other cars:

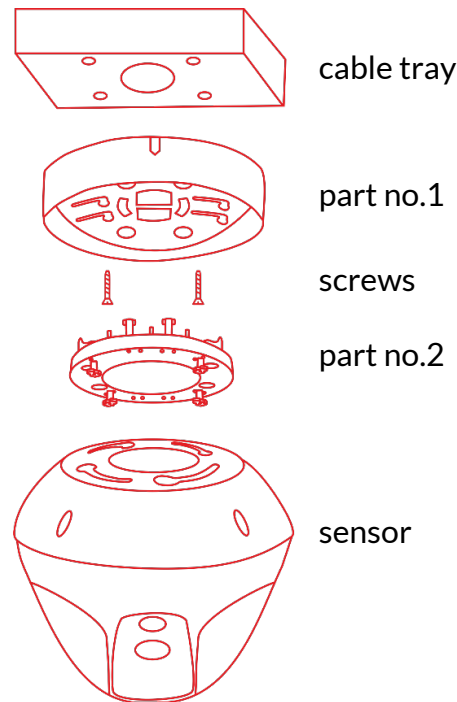


## 6. Installation and connection of the NODER IUPS-R sensor

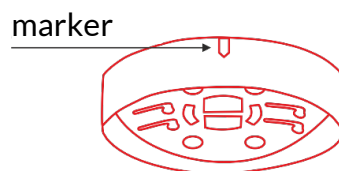
An important element in the correct operation of the NODER parking space occupancy detection system is the execution of the correct installation including the correct mounting and connection of the equipment.

### 6.1 Installation of the NODER IUPS-R sensor

The steps required for the correct installation of a parking space occupancy sensor are described below.



- 1 Cut a 40mm diameter hole in a suitable location for the cable tray.
- 2 Insert part no. 1 into the cut-out hole so that the marker is facing the direction of the parking space.

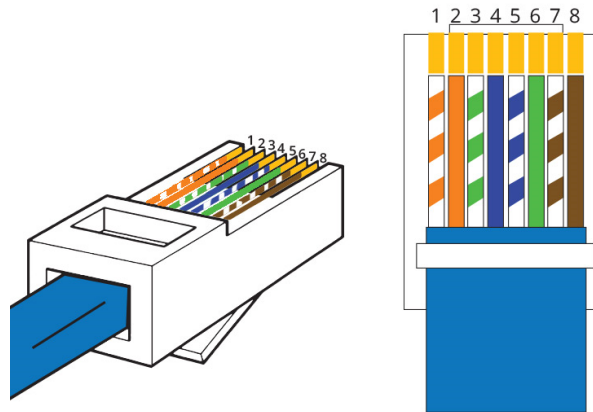


- 3 Use  $\varnothing 4 \times 10$  self-drilling screws to screw on the body section.
- 4 Connect part number 2 to part number 1 using the hooks on part number 2.
- 5 Connect part number 2 to the sensor using the hooks on part number 2.

## 6.2 Connection of NODER IUPS-R sensor

The NODER IUPS-R sensor has 2 RJ-45 inputs. It is recommended to use good quality UTP cat 5e cables and patchcords to connect them to other devices. The first sensor closest to the concentrator should be connected to its RS-485 bus ([RX+] - brown, [RX-] - white-brown).

Use a power supply with an output voltage of 24V DC to power the sensors. The connection of the individual wires is described in the table below.



Wire number	Colour	Connection
1	White-orange	+24V
2	Orange	
3	White-green	
4	Blue	GND
5	White-blue	
6	Green	
7	White-brown	RS-485- (RX-)
8	Brown	RS-485+ (RX+)

The RJ-45 interface configured in this way must be connected to the first sensor. The use of a single line bus structure is recommended when connecting up to 20 detectors. An alternative method is to connect the structure in a "T", i.e. to create two parallel lines. This method reduces voltage drops. This solution allows up to 32 detectors to be connected to a bus.

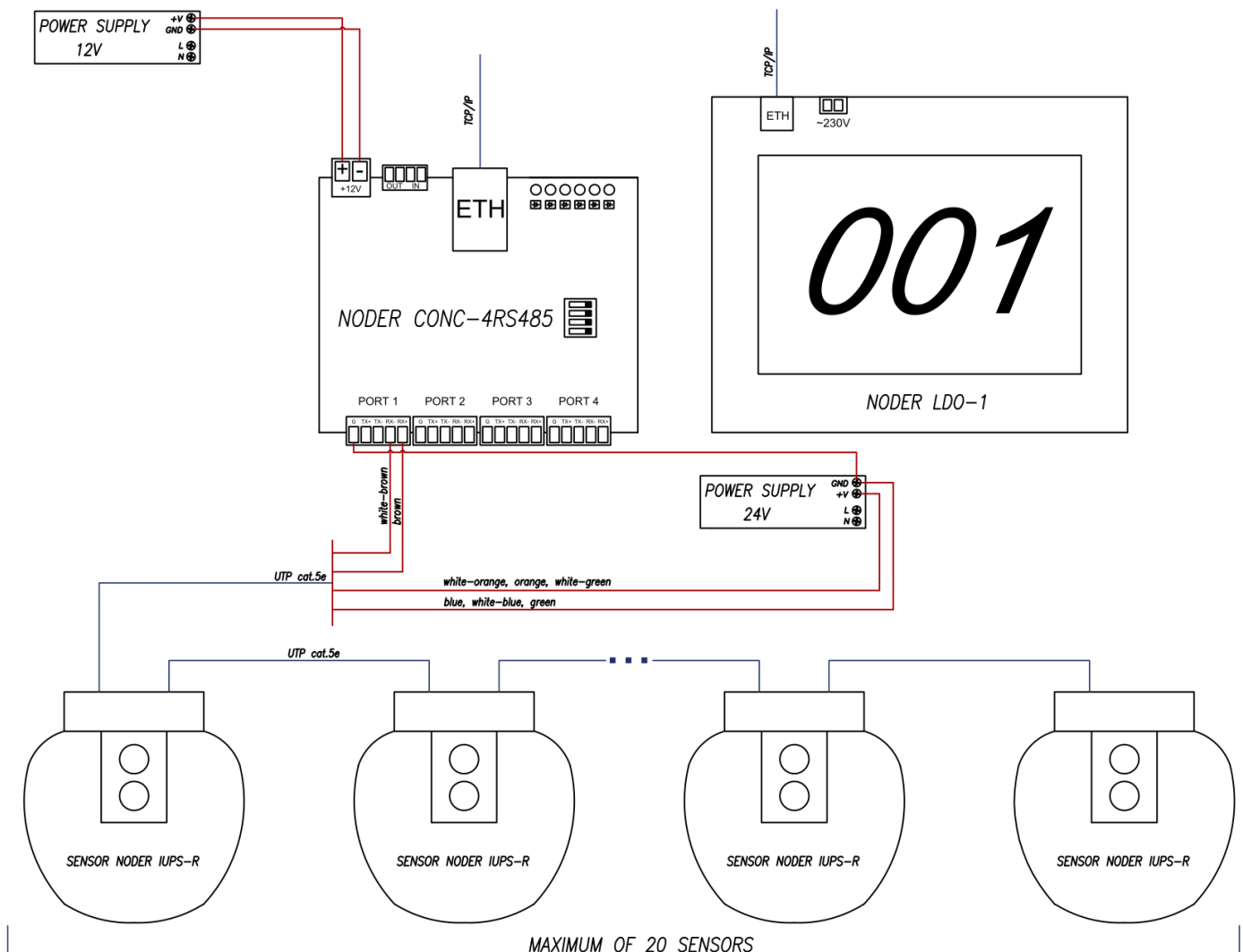
Use factory terminated UTP Cat. 5e patchcords to connect parking sensors. Devices must be connected in series (see -> **7. Connection diagrams**). The maximum number of units that can be connected to a single concentrator bus port is 32. A concentrator with four RS-485 busses can support up to 128 sensors in total. Use a power supply with an output voltage of 12V DC to power the concentrator.

## 7. Connection diagrams

Below are examples of how sensors can be connected to the first port of the concentrator and an LED board connected to the parking space occupancy detection system via a TCP/IP network to display the number of free spaces.

The recommended cables for connecting the power supply to the controller and concentrator are: H07V-K / LgY 1,5 750V.

A maximum of 20 sensors per bus port can be connected per line. In this case, the first sensor is connected to the power supply (power supply) and to the hub ports (RS-485 communication), while the subsequent detectors are connected in series via patchcords (sensor to sensor). The use of more sensors on one line is not recommended due to voltage drops on the wires and connectors, which results in an insufficient voltage level for proper operation of the devices furthest from the power supply.







To change the IP address, go to the **Network** tab. In the window that opens, you can change the network settings:

## Etherent to 4xRS converter

**Start**

**Network**

**RS port**

**Statistics**

**Password**

# Network settings

The page allows you to change the network configuration of the device.

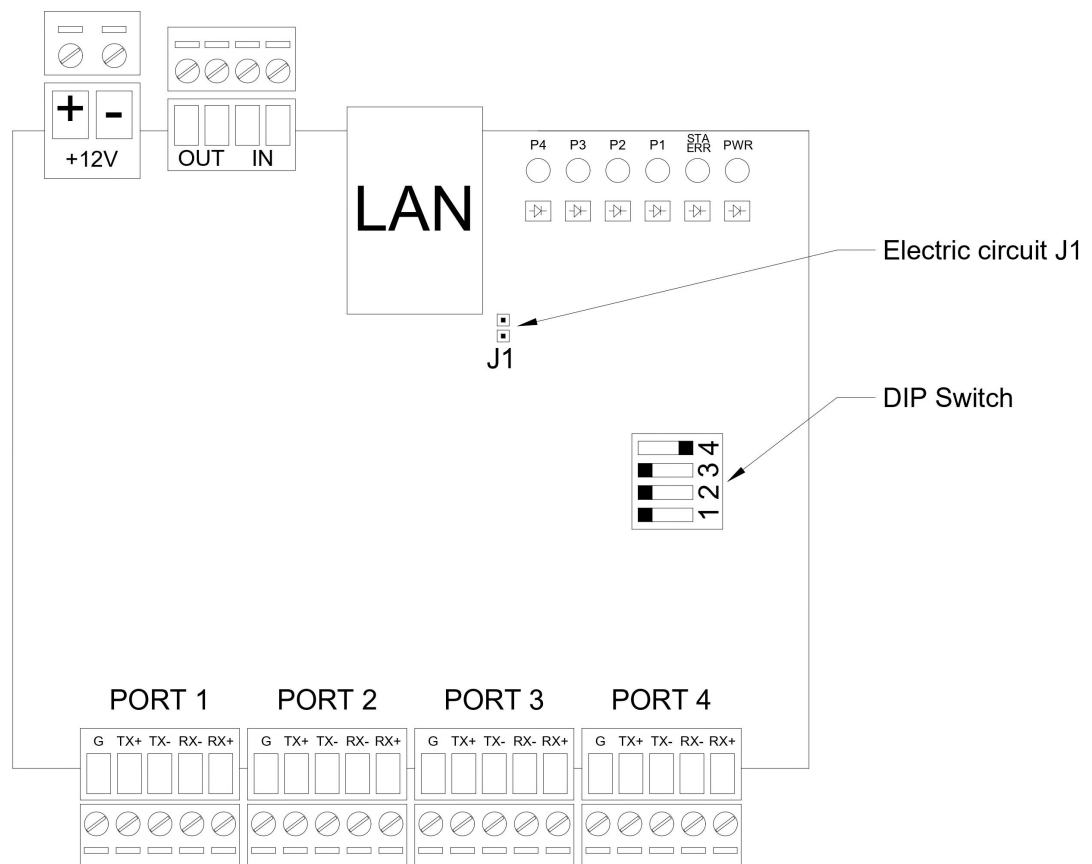
**NOTE:** Changing network settings may cause you to lose the connection to the device

Please enter your new network configuration below:

<b>MAC address:</b>	<input type="text" value="00:1E:C0:B8:38:59"/>
<b>NetBios name:</b>	<input type="text" value="ETH-RS422-4P"/>
	<input type="checkbox"/> Enable DHCP
<b>IP address:</b>	<input type="text" value="192.168.117.230"/>
<b>Gateway:</b>	<input type="text" value="192.168.117.1"/>
<b>Subnet mask:</b>	<input type="text" value="255.255.255.0"/>
<b>TCP port 1:</b>	<input type="text" value="6001"/>
<b>TCP port 2:</b>	<input type="text" value="6002"/>
<b>TCP port 3:</b>	<input type="text" value="6003"/>
<b>TCP port 4:</b>	<input type="text" value="6004"/>
	<input type="button" value="Save"/>

## 9. Restoring NODER CONC-4RS485 Controller to factory settings

If the device is incorrectly configured, it is possible to restore it to the factory settings. To do this, switch 1, 2 and 3 on the **DIP Switch** to the upper position. Then a jumper must be placed on the electrical circuit **J1** to close the circuit. After these steps, the device should be restarted from the power supply. After restarting, the concentrator should be restored to its initial settings. After the reset, remember to return the **DIP Switch** to its original position, and remove the jumper from circuit **J1**.





## 10. Addressing the NODER IUPS-R sensor

### 10.1 Description of the configuration device

The configuration tool is a device for remote communication with sensors not equipped with a Dip switch. It allows the user to set the address of the sensor, determine the reading distance and change the colour of the sensor. There can be one device on each RS-485 bus with a given address between 1 and 32.

### 10.2 Installation of the device and software

The configuration device should not be further than 0.5m from the sensor during communication. On the other hand, the maximum distance between the configurator and the Android device on which the configuration application is running should be no more than 10.0±2.0m.

#### 10.2.1 Installation of software

The sensor configurator app is only available for Android devices. **Please note that for the application to work properly, the system language of the device must be changed to English.**

Copy the application file "**Ultrasonic detector V3.7.6.apk**" to the device memory. Then run the file manager available for the device, select the installation file you are interested in and install it.

The application file is available for download from this link: [Ultrasonic detector V3.7.6.apk](#)

#### 10.2.2 Installation of the configurator

The configurator should be connected to the power supply via a USB port. If available, it can be connected directly to a mobile device. A flashing LED on the configurator will indicate a properly functioning device.

To connect to the configurator after launching the application, first check that Bluetooth is enabled on your device. Then select "**Search**" in the mobile application and a list of available devices will be displayed.

Select the required device from the list displayed and then select the "**Connect**" option to connect to the Configurator and enter the sensor settings interface. A steady light on the Configurator indicates a correctly connected device.

If necessary, you can disconnect the device from the mobile application using the "**Disconnect**" option and clear the list of available devices using the "**Clear**" function.



## 11. Basic sensor configuration

During configuration, the appropriate distance between the sensors must be maintained to prevent the possibility of configuring two sensors at the same time. When new sensor parameters are read or written correctly, the device will blink.

### 11.1 Read and change sensor address


To read the current sensor address and reading height, point the configurator towards the sensor and press **"READ"**. When read correctly, the current device parameters should appear in the application. To change the address or reading height of a particular sensor, simply enter the required parameters into the fields, point the configurator towards the sensor and press **"SETUP"**. Once the parameters have been transferred correctly, the sensor will blink and the address in the application will automatically be raised by 1, which gives the operator the possibility to serially assign addresses to subsequent sensors without having to manually change the address for each subsequent device.

## 11.2 Change of colour of the sensor's occupancy status

The application offers the possibility to set the colour of the sensor in its "free parking state". To change the colour, select the option of interest in the drop-down list under **"No Parking Light Control"**, point the configurator towards the sensor and press **"SETUP"**. Once the parameters have been transferred correctly, the sensor will blink in the selected colour.

BASIC PARAM

ALGORITHM



Address: 1 Installation Height: 250

READ

SETUP

**Note: Address of adjacent lots must be consecutive, e.g. 1, 2, 3, ...**

No Parking Light Control

Green

White

Cyan

Magenta

Violet

Blue

SETUP

Parking Lot Status

AUTO-CALIBRATION

OBTAIN