Smart Lots, Easy Parking

Digital Parking

Specification of Intelligent Parking Light

1. Overview

Intelligent parking light is a digital parking equipment designed for the requirements of parking in underground garage. This product can not only be used to detect current parking status, but also display red, green and yellow traffic lights for indication real time. Besides of parking function, this light have integrated with advanced functions of smart lighting and driving route guidance for traffic of garage. With microwave activity sensor, it can be energy-saving when people/car come and go. As a highly integration product, intelligent parking light can be quickly mounted on ceilings and set up like other smart lights through Bluetooth mesh by phone and IoT gateway which is really suitable for all garages. In one word, this product is a dedicated genuine parking light.

2. Main features

- Three-color traffic light for parking status, linear light for basic illumination of garage, both are energy saving, long life.
- Use three laser ranging sensors (max 6 meters range) detects max 3 parking lots status in real time, use microwave radar module for activity of people/car to do basic illumination control.
- Embedded with BLE Mesh module inside, which can make all parking lights in garage as a whole IoT network. All parking status data will be uploaded to cloud based parking system through IoT gateway.
- Utilize with Bluetooth RSSI, it can cooperate digital map for parking positioning with assistance of Wechat applet or other html5 based app.
- Integrated smart light control, achieve energy-saving lighting in garage.
- Can provide communication relay for Bluetooth ground lock, provide flashing light or alarm for service of parking.

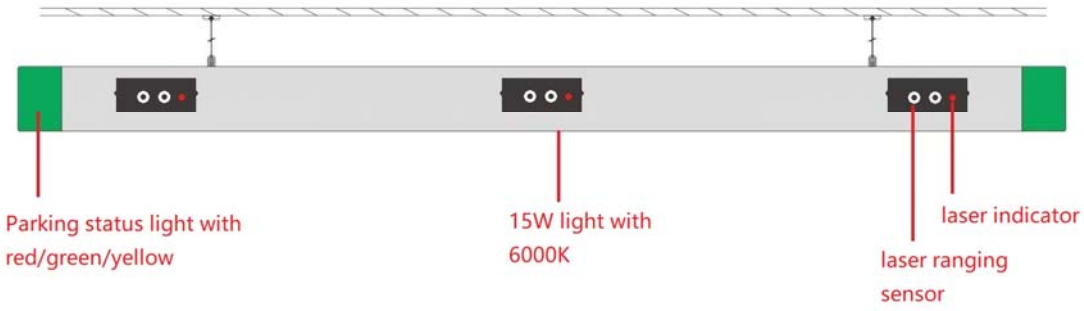
3. Technical specifications

Product name	Intelligent parking light
Model	CJD-1
Voltage	220V AC

Power	18W
Working frequency	50Hz
Illumination	16w 2835 packaged light bead
Color temperature	6000K
RF type	Bluetooth Mesh 2.4GHz
IP grade	IP40
Working temperature	-20℃~+45℃
Size	1200mm

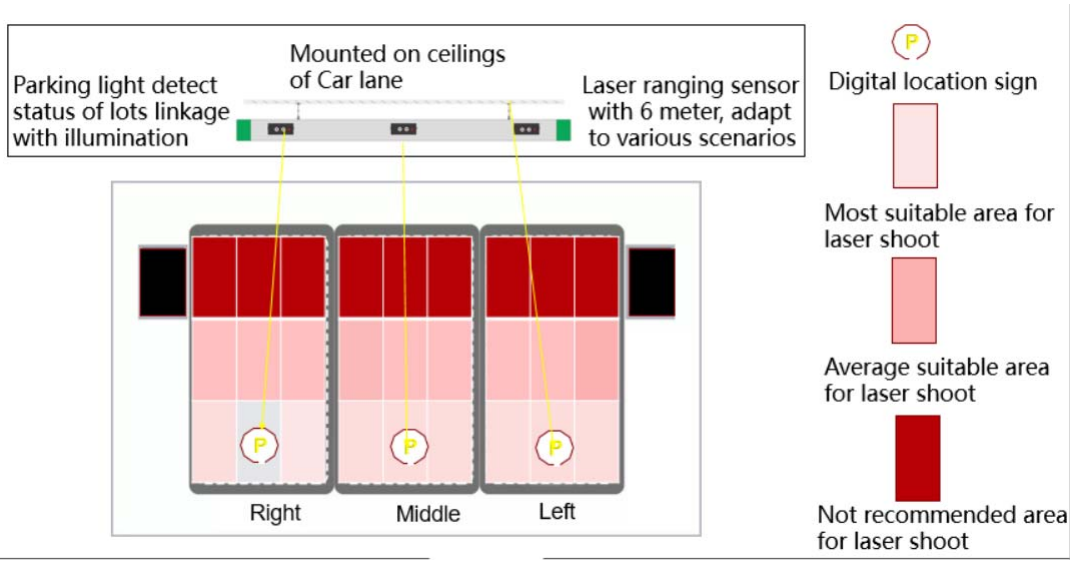
4. Appearance

The overall structure of intelligent parking light is shown in Figure below



5. Mechanism of parking detection

The equipment can be used to detect status of parking lots 1~3. The demonstration of laser shoot is advised as below:



Light is mounted on ceilings of both sides of the driveway in the garage, which should be generally symmetrical to the corresponding parking lots area. Three laser ranging sensors are all with same range distance capability within 6 meters, according to the

change of ranging from laser sensors to lots compared with a range threshold that can determine which are empty or occupied.

Please install light when there is no car in the parking space. You need to activate the laser indicator first, then adjust the laser turntable to make the laser fall on the rear of the parking space, and use wechat applet app to check that the ground distance is more than 5.2 meters when there is no car, and the parking threshold of the light is generally set to 5 meters. If the distance measurement is shortened by less than 5 meters when the car is parked in the parking space, it is deemed that there is a car.

In order to adapt to different installation situations of garage environments, there are three other parking range thresholds for detection, namely 4.2 meter, 3.8 meter and 3.6 meter, which can be shifted manually. See 5.1.3 for more details.

4.2 meter range threshold:

Left and right lots, greater than 4.2 meters is empty, less than 4.2 meters is occupied.
Middle of lots, greater than 4 meters is empty, less than 4 meters is occupied.

3.8 meter range threshold:

Left and right lots, greater than 3.8 meters is empty, less than 3.8 meters is occupied.
Middle of lots, greater than 3.6 meters is empty, less than 3.6 meters is occupied.

3.6 meter range threshold: (factory default)

Left and right lots, greater than 3.6 meters is empty, less than 3.6 meters is occupied.
Middle of lots, greater than 3.4 meters is empty, less than 3.4 meters is occupied.

Because laser range detection sometimes can be affected by the reflectivity interference of glass and mirror surface which will cause distortion of results. Beside of judging the parking status based range distance, algorithm will be used to combine with other factors and data to enhance efficiency of detection.

5.1 Light installation

Before installation, please confirm whether the equipment in the packing box is in good condition and whether all components, such as suspension wires/rods, are all prepared.

If the lights needs to be configured with online applications, such as digital map or other advanced functions such as entrance guidance screen, etc. It should be better to make more detailed planning for whole garage before installation, such as divide large garage spaces into several sections, allocate gateways for sections, group selected lights and binding their ID with lots within sections, and binding Bluetooth ID of lights into the corresponding gateways nodes in advance to avoid adjustment during installation.

5.1.1 Calibrate the installation position.

It is strongly recommended to install the lights while no vehicle parked in the parking space.

The equipment can be installed as conventional ways for normal lights, using suspension wires or rods, and the height to ground can be adjusted according to the

ceiling height to ensure that height between the light and the ground is more than 2.5 meters, and it is generally recommended to be around 2.6-3 meters. For driving safety purpose, it is not recommended to mount it as lower. The projection distance between the light with front of lot line should be 1 meter, which also can be adjusted based on investigation during installation. The principle of installation should be symmetrical to the parking area to be detected, such as the installation position should be aligned with middle of the center lot for 3 lots; If two lots, align with middle line between them. This is not only for aesthetic purpose, but also convenient for setup of range threshold of 3 laser sensor.

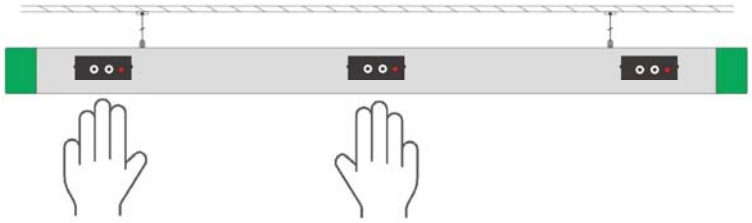
5.1.2 Engineering specification

The explosive expansion nail is recommended for fixing the ceiling by suspension wires or rods, and its specifications are consistent with the aperture of the fixed bowl. Be sure installed tightly, light will not swing to loose. Before positioning the suspension wires or suspenders, it is best to use laser marking equipment to ensure holes of the suspension wires or rods parallel with the car lane on the ceiling.

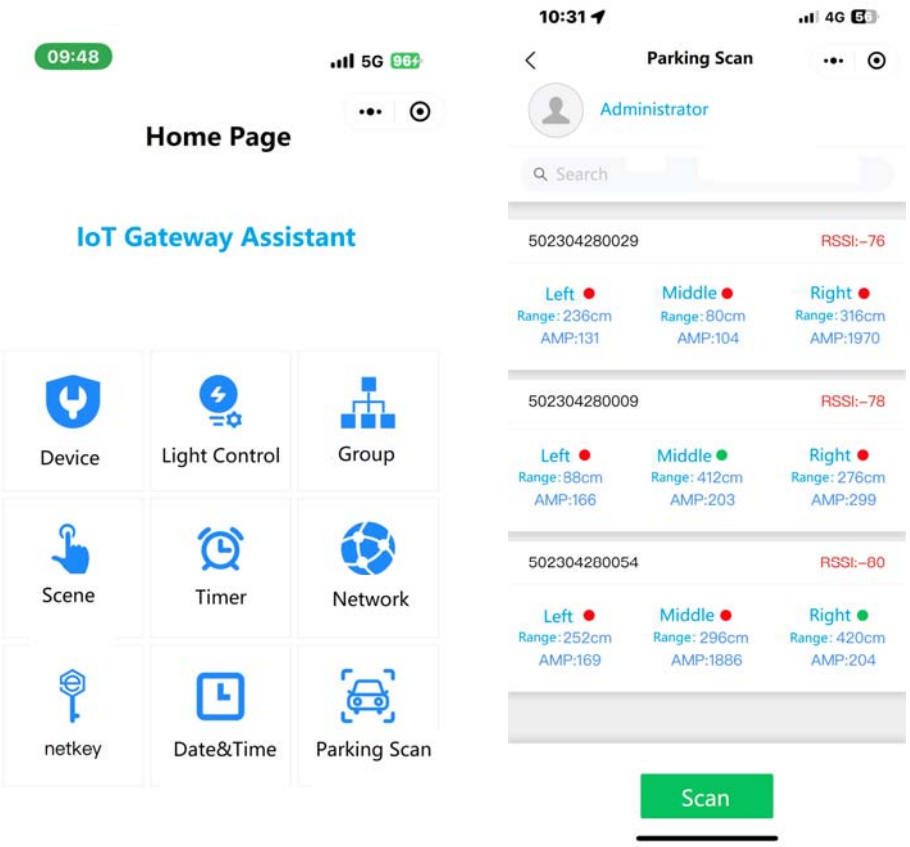
5.1.3 Light configuration

After the light is fixed well, worker can use hands to closely cover the middle sensor and any one of left/right laser sensor for about 3 seconds at the same time, so that the whole light will enter the installation mode. Under this mode, laser sensor will ignite red indicator, which will help workers to adjust horizontal and pitch directions and aim at the rear area in the parking lots.

Once installation mode are started, hands need to leave the laser sensors immediately. Under this mode, the colors of the parking status light on both sides represent different range threshold level, rather than parking status in real time. After the installation mode lasts for a period of time, it will automatically exit and back to the detection mode.



The laser ranging data of the light will be broadcast through the built-in Bluetooth, and the real-time ranging situation can be viewed by using the specific WeChat applet “IoT assistant” – parking lights scanning. Here the AMP data means amplitude of reflective rate for laser signal feedback.



There are two ways to shift the laser ranging threshold of lights:

1， When you cover the middle laser sensor and any one of left/right laser sensor with hands for more than 30 seconds, it can see that the colors of the parking status light on both sides will switch, and this process must be continuously without interval. At this time, the different colors of parking status light on both sides of the light represent different threshold.

Under installation mode:
Red: 3.6m threshold, **Green**: 3.8m threshold, **Yellow**: 4.2m threshold, **Dark**: other user-defined threshold.

If the shift action is not successful, you can wait until the installation mode exits, and then repeat this operation.

2， Lights are connect to the IoT gateway through Bluetooth mesh, and the threshold can be modified on the assistant applet of the IoT gateway. That is useful for many user-defined cases.

5.1.4 Power on the light

The equipment is powered by 220V, and the wiring is electrified according to the requirements of conventional lighting standards. The power wires should not be exposed outside, and corrugated pipes or slots should be used for protection. After the equipment is powered on, check whether the whole light is working well by appearance and BLE data broadcasting for laser sensors.