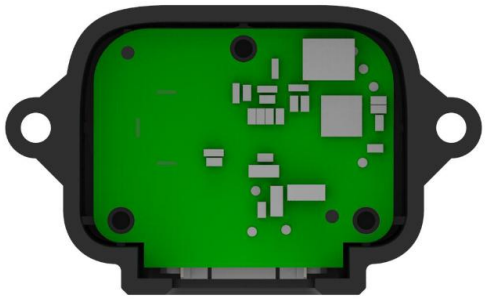
REPORT
2019

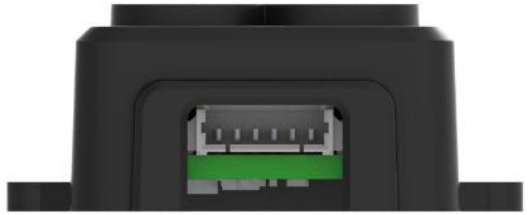
Benewake

Luna Applied Market

Luna Technical Specifications and Parameters

Description		Parameters
Product performance	Operating range	0.2m~8m(90%reflectivity)
	Accuracy	±6cm@（0.2m-3m） ±2%@（3m-8m）
	Distance resolution	1cm
	Frame rate	100Hz
	Ambient light immunity	70Klux
	Operation temperature	-10℃~60℃
	Enclose rating	/
Optical parameters	Light source	VCSEL
	Central wavelength	850nm
	Photobiological safety	Class1（IEC60825）
	FOV	2°
Electrical parameters	Supply voltage	5V±0.1V
	Average current	≤70mA
	Power consumption	≤0.35W
	Peak current	150mA
	Communication level	LVTTL（3.3V）
	Communication interface	UART / I2C
Others	Dimension	35mm*21.25mm*12.5mm (L*W*H)
	Housing	ABS+PC
	Storage temperature	-20℃~75℃
	Weight	＜5g



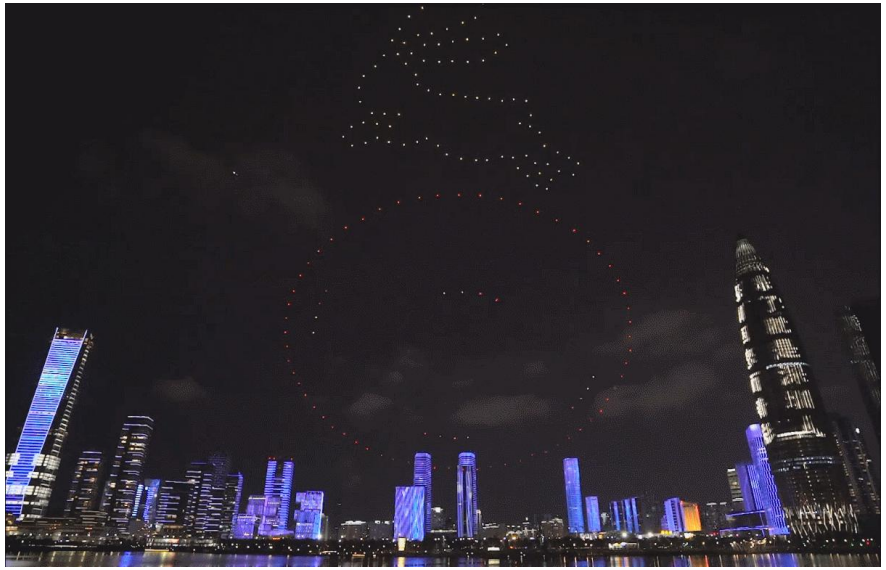


Main Applied Market

Benewake

- Drone
- Smart Robot
- Projector
- Smart Advertising
- Smart Furniture
- Smart Trash
- Smart Toilet
- Attendance Machine
- Access Gate
- Street Light
- Traffic Statistics
- Laneway Positioning
- Elevator Advertising
- Elevator Space Occupation
- Face Payment

Luna Main Applied Market : Positioning in drone formation performances



Introduction

- TF-Luna is installed under the drone, and the LiDAR detects vertically downward. The drone formation performance will be completed through the cooperation of several drones. The performance environment is divided into indoor and outdoor.
- Indoor performance: drones generally fly above 1m, and the distance is about 1m. Because the performance drones need to reach their designated location at the designated time, each drone needs to be positioned.

Advantages

- Technical advantages: high detection frequency, small blind area (upgrade mini :10cm), anti-light interference; sufficient indoor distance, small reflectance impact, can deal with different stage floors
- Implementation advantages:
  - Simple installation, easy integration, optional protection (module or IP65)
  - Support Pixhawk flight control plug and play
- Competitive advantages: faster than ultrasonic / infrared detection frequency, high accuracy, will not interfere with each other (ultrasonic waves have mutual interference problems); infrared detection speed is slow, and it is susceptible to ambient light interference

Luna Main Applied Market : Smart screen

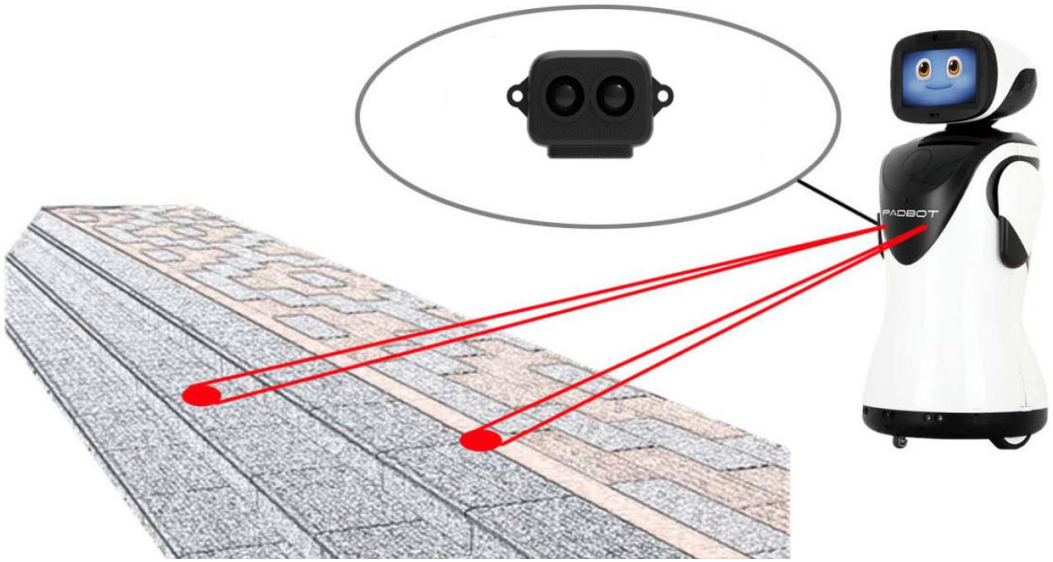
Introduction

- TF-Luna is installed on the smart fitting mirror, real-time detection of whether someone is approaching, realizing switch function between the advertising screen and the fitting mirror

Advantages

- High detection rate and fast response
- Stable and reliable performance, accurate ranging
- Small size for easy integration
- Longer detection distance than traditional infrared products
- Small light spot, not easy to cause misjudgment

Luna Main Applied Market : Robot anti-fall



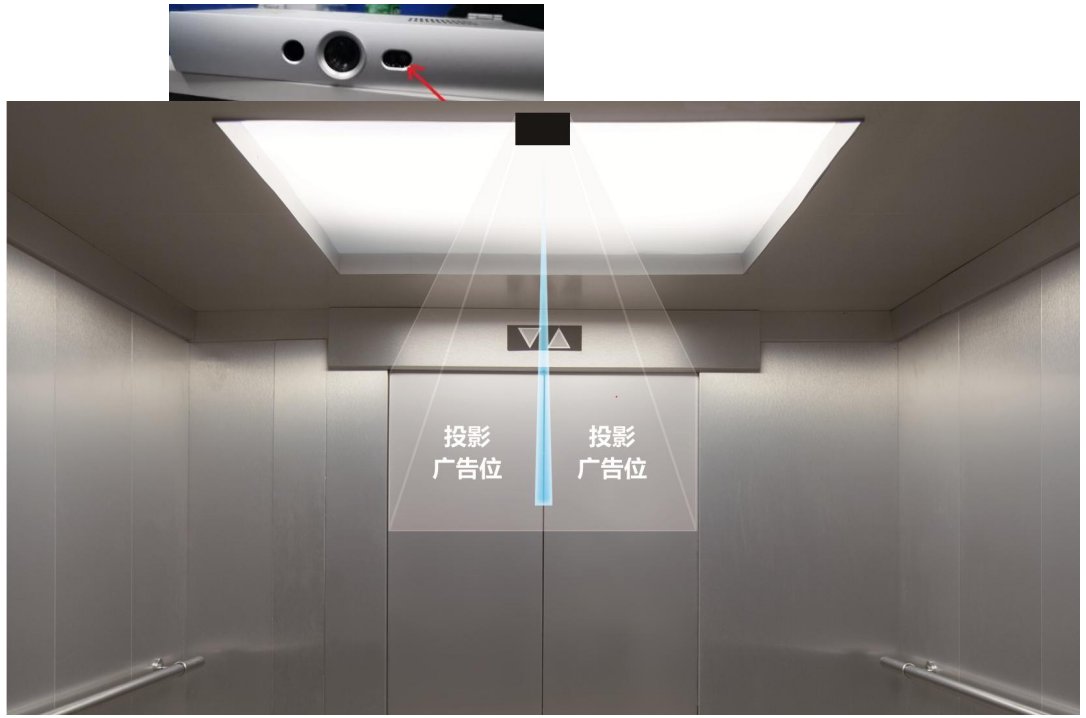
Introduction

- TF-Luna is installed in front of the robot to detect whether the road surface in front of the oblique front is smooth and obstacles, so as to realize anti-fall and anti-collision functions

Advantages

- Technical advantages: tilt detection, high accuracy and stability
- Implementation advantages: modular design, easy integration
- Competitive advantage: Stable and reliable than ultrasonic, anti-interference
- Product advantages: high cost performance, small size, low power consumption

Luna Main Applied Market : Elevator advertising projection



Introduction

- TF-Luna is integrated into the projector and installed on the opposite side of the elevator door. When detecting that the distance from the projector to the elevator door changes, start video projection.

Advantages

- Technical advantages: high accuracy, stable performance, small FOV, stable recognition of changes in distance
- Implementation advantage: TF-Luna is integrated in the projection equipment, which can be installed directly above the elevator
- Competitive advantage: stable and reliable than accelerometer, no delay; easier to integrate than image recognition, no need to write complex visual algorithms
- Price advantage: consumer price

Luna Main Applied Market : People flow, height statistics

Introduction

- TF-Luna is installed above the door, and the LiDAR detects vertically downward. When a person enters the detection area, the distance value will change, and the number of people will be output. In this case, the number of people will increase by 1, and the height will be calculated.

Advantages

- Technical advantages: high accuracy, small FOV, stable and reliable ranging, high refresh rate, sensitive detection of dynamic people flow
- Implementation advantages: small size, convenient installation
- Price advantage: consumer price

Luna Main Applied Market : Projector assisted focusing

Introduction

- TF-Luna is installed inside the projector for auto-focusing / assisted focusing to ensure the optimal projection effect and image quality

Advantages

- Technical advantages: accurate ranging, high accuracy and stability
- Implementation advantages: modular design, easy integration
- Competitive advantage: It is more reliable than analyzing distance through image algorithms, and is not affected by projector light.
- Product advantages: high cost performance, small size, low power consumption

Luna Main Applied Market : Smart furniture

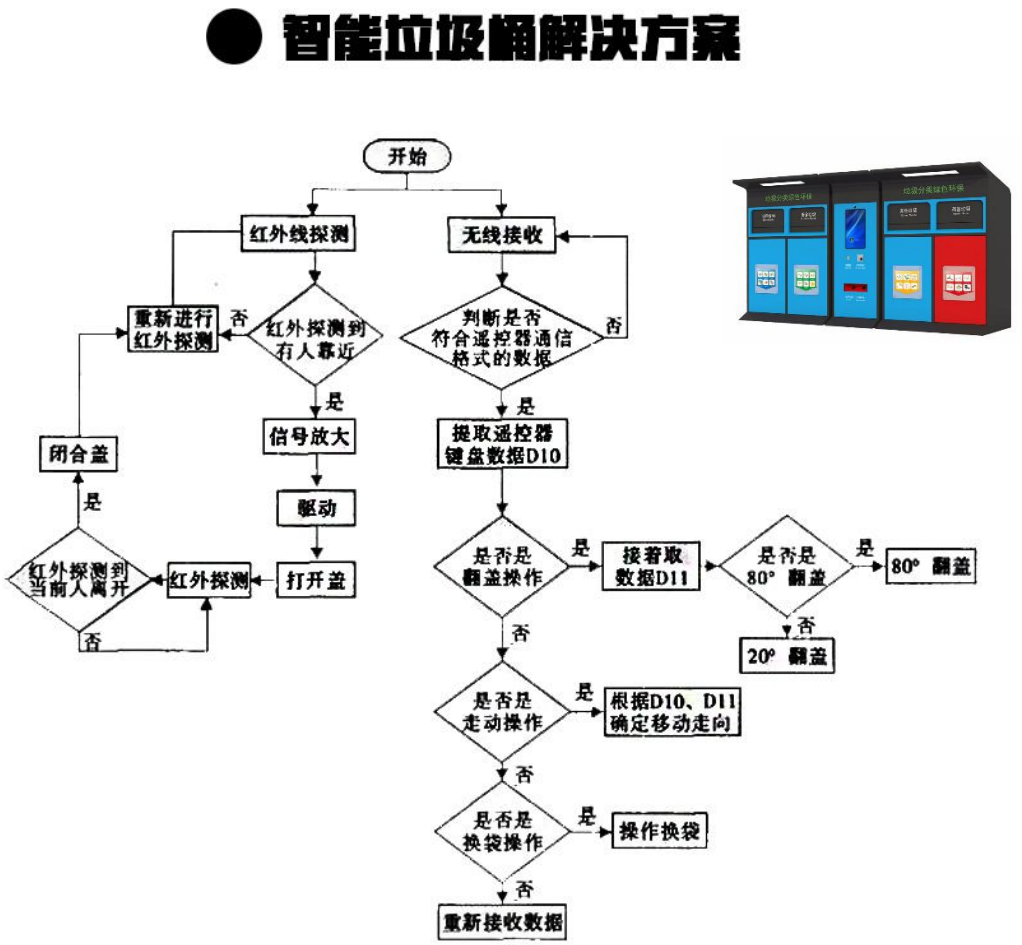
Introduction

- TF-Luna is used as a smart home trigger to implement smart home function triggering. For example: intelligent lighting trigger
- Smart access control trigger; smart magic mirror trigger; smart TV tracking; smart bathroom trigger etc.

Advantages

- Technical advantages: high accuracy, small FOV, stable and reliable ranging, and high refresh rate
- Implementation advantages: small size, convenient installation, easy integration, can be used for triggering of various smart home devices
- Price advantage: consumer price

Luna Main Applied Market : Smart Trash



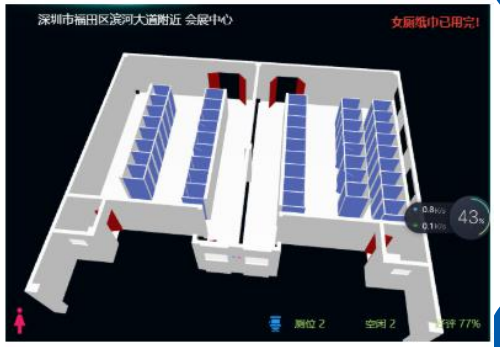
Introduction

- TF-Luna is installed inside the smart trash can and is used to detect the empty status of the trash can
- TF-Luna is installed on the outside to detect if anyone is approaching, and if it is approaching, open the lid

Advantages

- Technical advantages: high accuracy, stable and reliable ranging, and high refresh rate
- Implementation advantages: small size, convenient installation
- Price advantage: consumer price

Luna Main Applied Market : Smart public toilet



Introduction

- TF-Luna detects if someone is in the toilet
- TF-Luna detects public flow in public toilets

Advantages

- Technical advantages: high accuracy, stable and reliable ranging, high sensitivity, and high refresh rate
- Implementation advantages: small size, convenient installation
- Competitive advantage: Stable and reliable than infrared, no battery replacement required, low maintenance costs
- Price advantage: consumer price

Luna Main Applied Market : Time attendance system

Introduction

- TF-Luna detects if there are people approaching in the detection zone
- TF-Luna measures the distance between the time attendance and personnel and assists in focusing

Advantages

- Technical advantages: high accuracy, small FOV, stable and reliable ranging, and high refresh rate
- Implementation advantages: small size, convenient installation
- Competitive advantage: Reliable than distance analysis by image algorithm, free from light interference
- Price advantage: consumer price

Luna Main Applied Market : Access Control

Introduction

- TF-Luna detects the entry of gate personnel and triggers the opening of photoelectric auxiliary facilities and gates
- TF-Luna detects if there are people near the automatic door and controls the automatic door switch

Advantages

- Technical advantages: high accuracy, small FOV, stable and reliable ranging, and high refresh rate
- Implementation advantages: small size, modular design, easy integration
- Competitive advantage: stable and reliable than infrared, anti-interference
- Price advantage: consumer price

Luna Main Applied Market : Street light controller

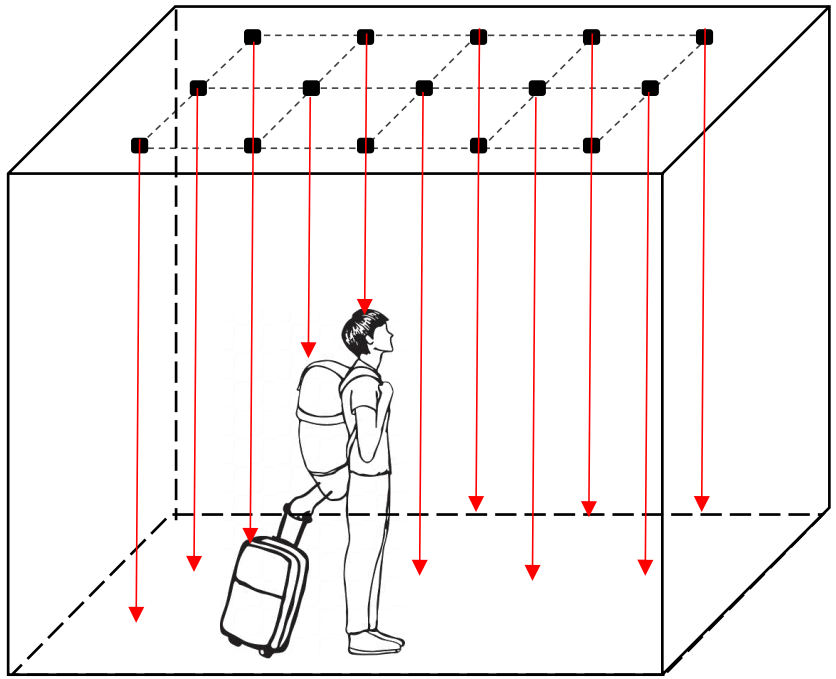
Introduction

- TF-Luna detects if someone is passing near the street light and triggers the automatic switch of the street light

Advantages

- Technical advantages: high accuracy, stable and reliable ranging, and high refresh rate
- Implementation advantages: small size, convenient installation
- Price advantage: consumer price

Luna Main Applied Market : Elevator space occupancy detection



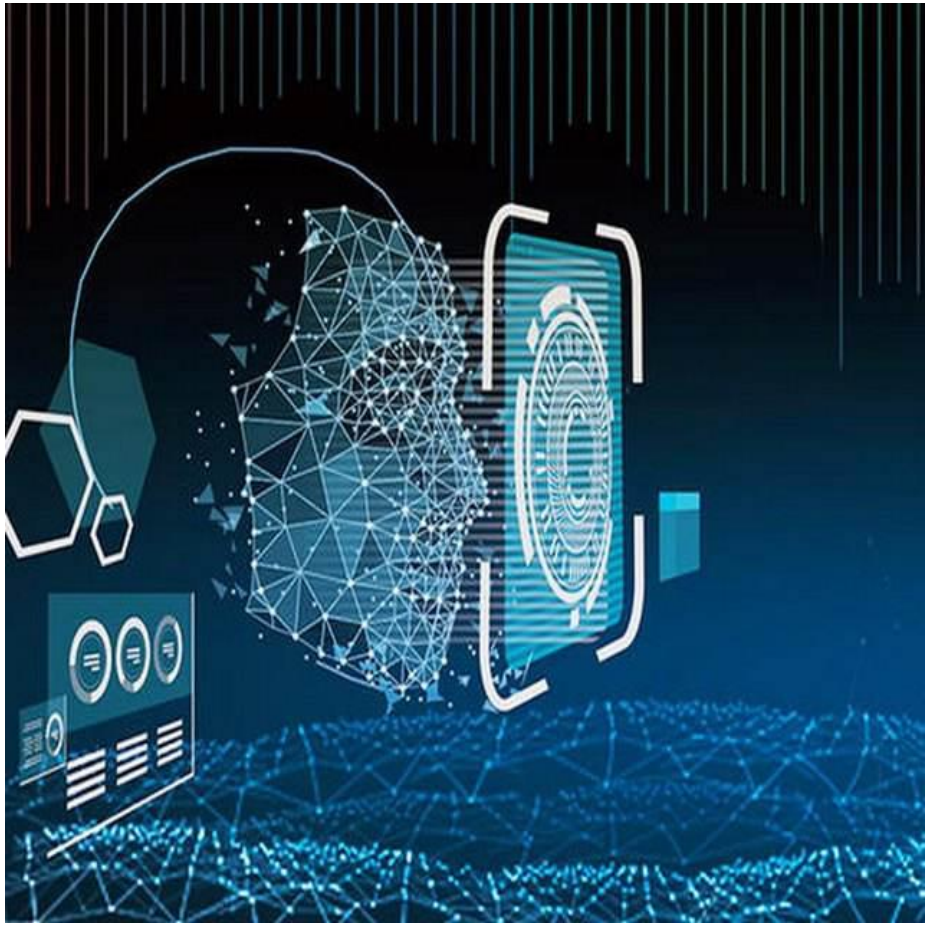
Introduction

- Use TF-Luna to make a 3 × 5 light array (adjustable according to the size of the elevator space), and place it on the top of the inside of the elevator to measure whether the internal space of the elevator is full.
- If it is full, the elevator will not stop at the middle floor, suitable for high-rise buildings

Advantages

- Technical advantages: high accuracy, stable and reliable ranging, and high refresh rate
- Implementation advantages: small size, convenient installation
- Competitive advantage: solve the problem that the elevator will stop when the weighing device does not detect overweight but there is no space in the elevator
- Price advantage: consumer price

Luna Main Applied Market : Face payment assisted focusing



Introduction

- TF-Luna detects if anyone is approaching before the payment device
- TF-Luna measures the distance between the payment device and the personnel and assists in focusing;

Advantages

- Technical advantages: high accuracy, small FOV, stable and reliable ranging, and high refresh rate
- Implementation advantages: small size, convenient installation
- Competitive advantage: Reliable than distance analysis by image algorithm, free from light interference
- Price advantage: consumer price

THANKS