PARKING GUIDANCE SYSTEM

# HARDWARE INSTALLATION MANUAL

# BIG THANKS

Thank you for choosing our product.

Ultrasonic detection technology based PGS (Parking Guidance System) is the most economic and stable solution in terms of parking guidance.

This manual will guide you through the installation process of the PGS system. Please do not hesitate to contact us in case you need extra info.

Cheers

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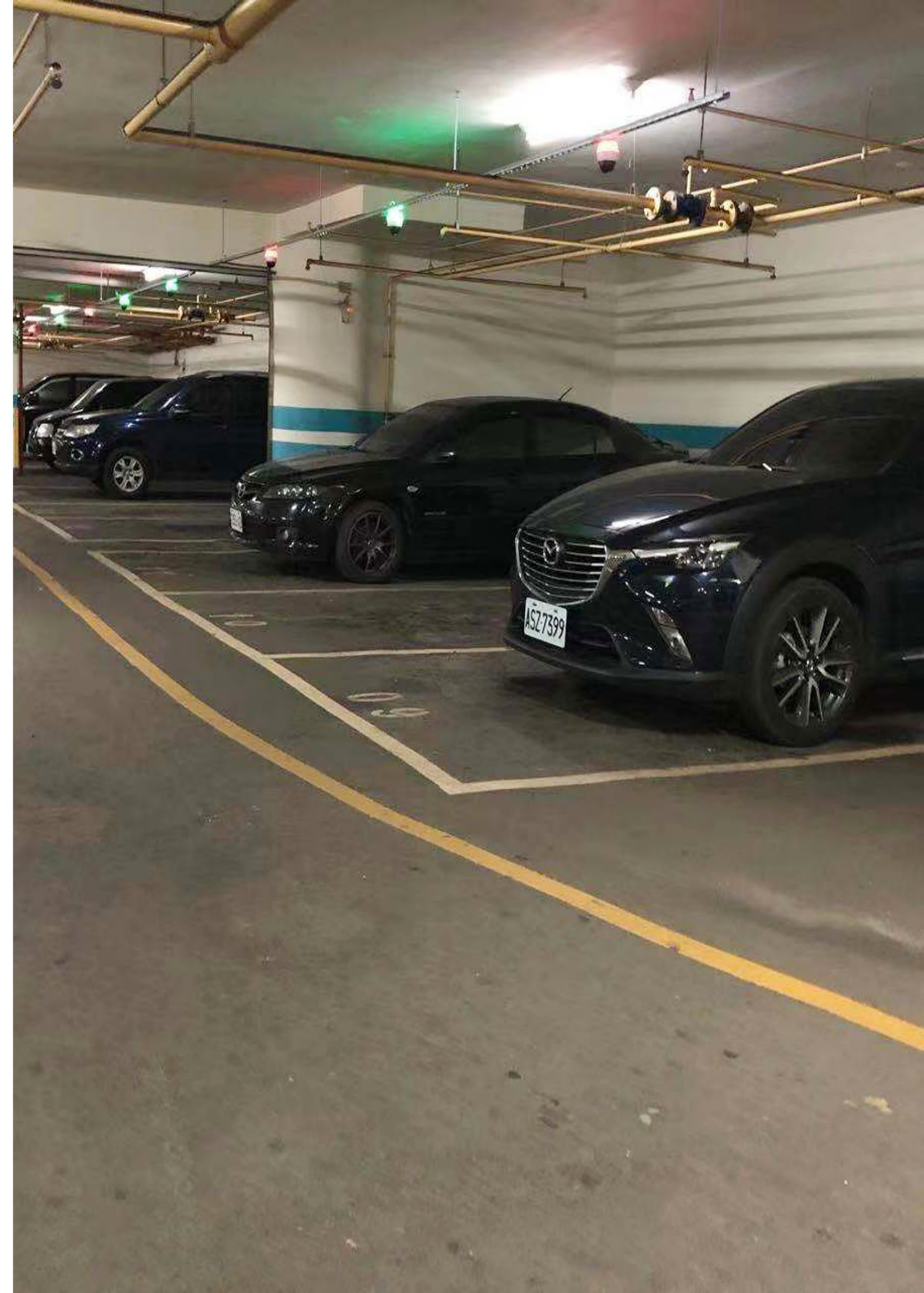
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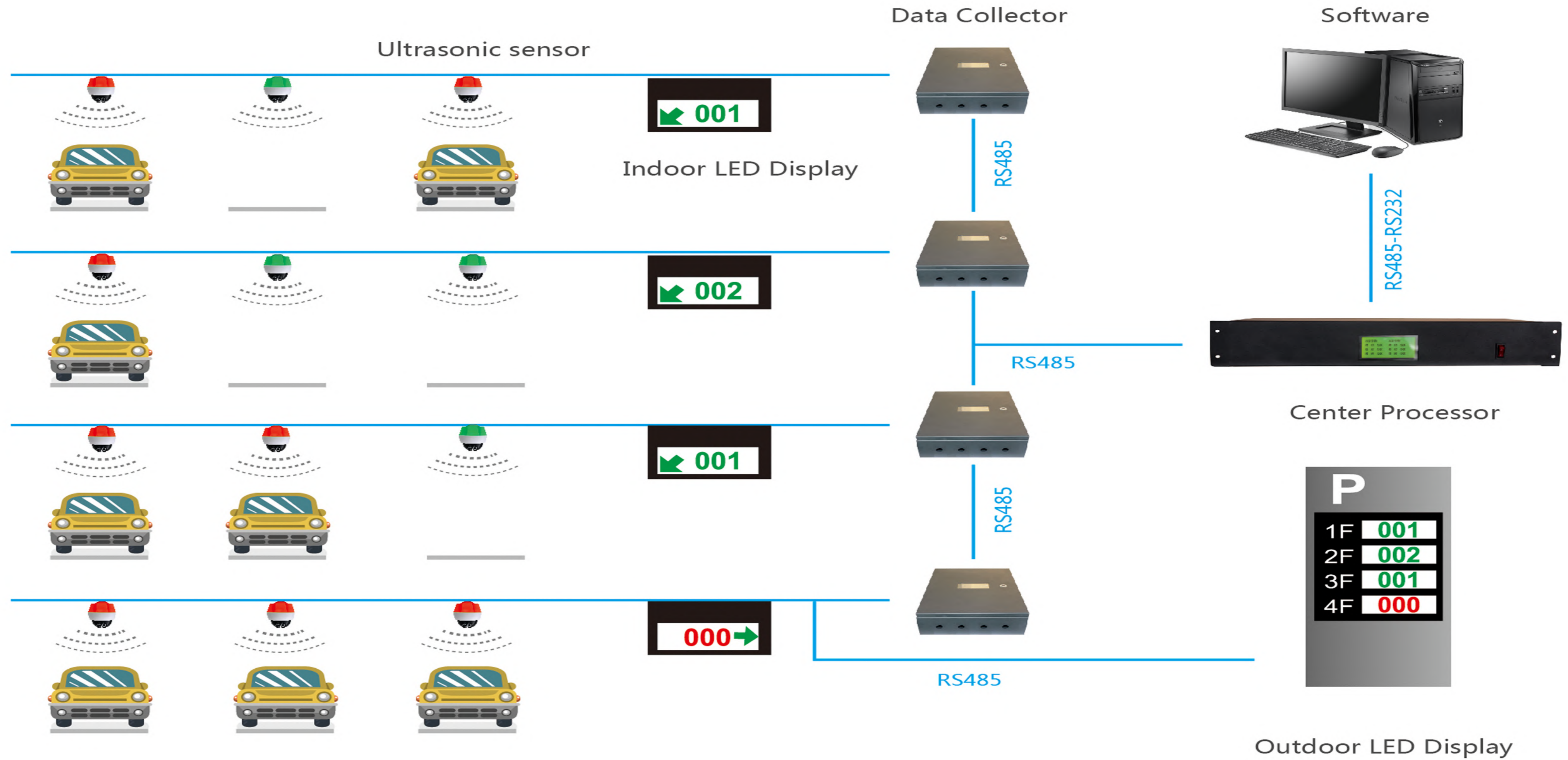
# System Introduction
## Parking Guidance System

Parking Guidance System is an electronic system benefits drivers, car park management and society. The design concept is to pinpoint available parking spaces and direct drivers to park within shortest time, and maximize facility usage.

The system applies ultrasonic detection technology to monitor the occupancy status of parking spaces, provide real-time data for the system, LED display signs and bay indicating lights intuitively guides drivers to available parking spaces.

Benefits of a Parking Guidance System includes maximizing facility usage & profitability, reducing air pollution, reducing management cost, improving customer experience and property image etc.

# PGS DIAGRAM

Ultrasonic sensor

Data Collector

Software

◤ 001

Indoor LED Display

◤ 002

RS485

RS485

Center Processor

◤ 001

RS485

000 ➤

P

| 1F | 001 |
| 2F | 002 |
| 3F | 001 |
| 4F | 000 |

RS485

RS485-RS232

Outdoor LED Display

# System Introduction
## Name Definitions

Followed table explains the definition of the names for PGS hardware components:

| # | Short Name | Full Name |
|---|------------|-----------|
| 1 | CCU | Center Processor |
| 2 | NCU | Data Collector |
| 3 | US | Ultrasonic Sensor |
| 4 | BI | Bay Indicator |
| 5 | LDS | LED Display Signage |

# Pre-cabling Instructions
## General info

Our PGS system applies RS485 communication technology, and works at lower voltage power (DC24V), a CAT 5 cable is capable to carry both RS485 data & DC24V power to the main components. Also, as we are using hand-in-hand wiring, it's very easy and economic to deploy the PGS system.

At proposal stage, we normally prepare only draft layout to present a basic image of the system deployment; when it moves to order stage, we will discuss and finalize system layout with customer, and prepare final CAD drawing accordingly.

PGS layout drawing intuitively indicates location of each hardware device, workers simply need to prepare the cabling accordingly.

# Pre-cabling Instructions
## Pre-cabling

Normally we recommend our customers to start cabling before hardware components arrive to site, we will ship back cover box for sensor / indicator earlier so they can prepare the site ready for hardware.

To make life easier for customer and ourself, all hardware components are pre-configured and well labelled, once they arrive to site, workers simply following the label info and put them to the right position, no need extra configuration to do.
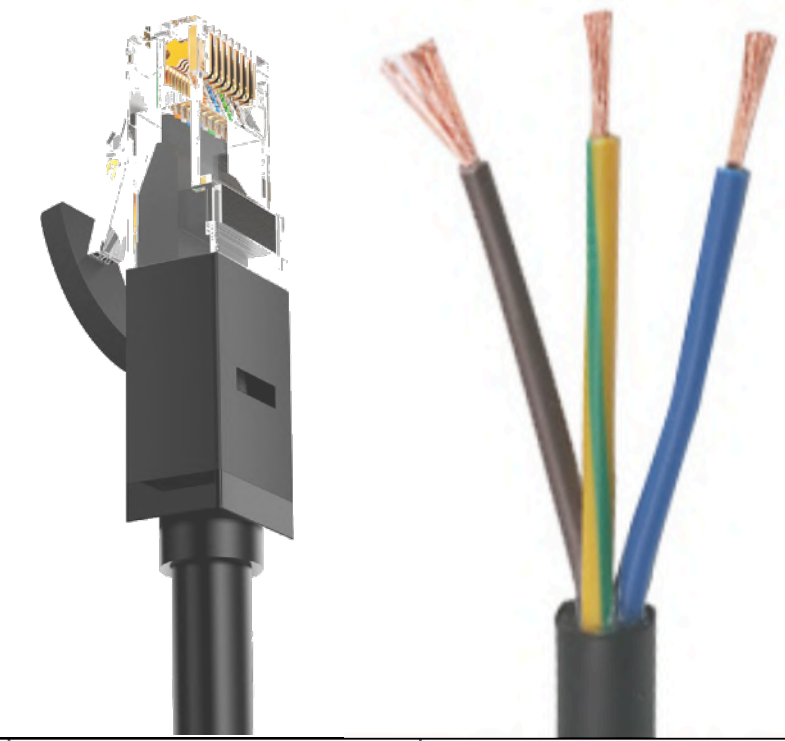
Popularly, PVC/KGB conduits are used (ceiling mount/hanging with rods) and in some cases larger cable tray are used when there are multi system running in the same site.

# Pre-cabling Instructions
## List of Materials

Followed are the list of materials required (qty per actual site situation)

| # | Material | Purpose | Qty | Unit |
|---|----------|---------|-----|------|
| 1 | KBG/PVC Conduit, 20mm(D) | Running cables | 2500 | meter |
| 2 | PVC/KBG Connection Parts - Straight Joint | Running cables | 100 | pcs |
| 3 | PVC/KBG Connection Parts - T Joint | Running cables | 300 | pcs |
| 4 | PVC/KBG Connection Parts - Elbow Joint | Running cables | 100 | pcs |
| 5 | PVC/KBG Connection Parts - Bold Connection | Running cables | 1000 | pcs |
| 6 | Suspender/Hanging Rods | Cabling/optional | 500 | pcs |
| 7 | CAT 5 (8*0.58mm), about 3m long, RJ45 on both end | For connection between sensor & indicator | 606 | pcs |
| 8 | CAT 5 (8*0.58mm), length per site situation, no RJ45 | For connection between Data Collectors | 500 | meter |
| 9 | RVV Single Cord 1.5mm*3 | Carrying AC power to Data Collector & LED Display | 500 | meter |

# Hardware Installation
## Unpacking

On each package there are labels indicating the position of the PGS components, during unpacking, please do not mix up, make sure they are going to the right place according to the CAD drawing.

CAUTION: during installation, please have the workers recheck the configuration on the hardware device with config file provided.
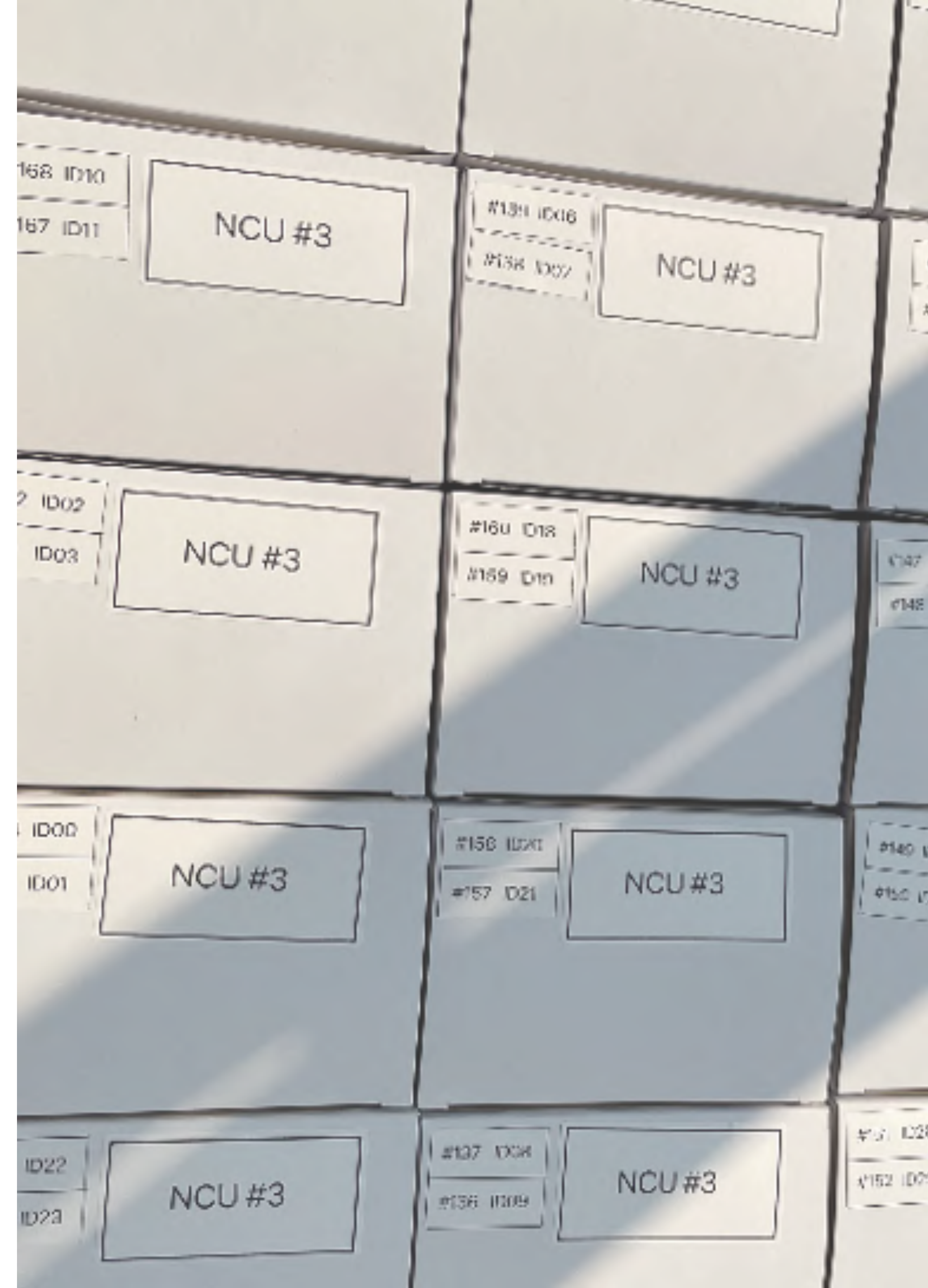
# Hardware Installation
## Data Collector

NCU installation position per CAD design. They are wall mount design (4X M12 installation holes on the back panel) and we need 2 cables:

- Power Cable (RVV Single Cord 1.5mm*3) brings AC power to power up the device;

- CAT 5 (RJ45 on both sides, length per site requirement) runs RS485 data;

# Hardware Installation
## Center Processor

CCU is to be installed at control room (engineering room). It's 2U rack mount design and we need 2 cables:

- Power Cord brings AC power to power up the device;

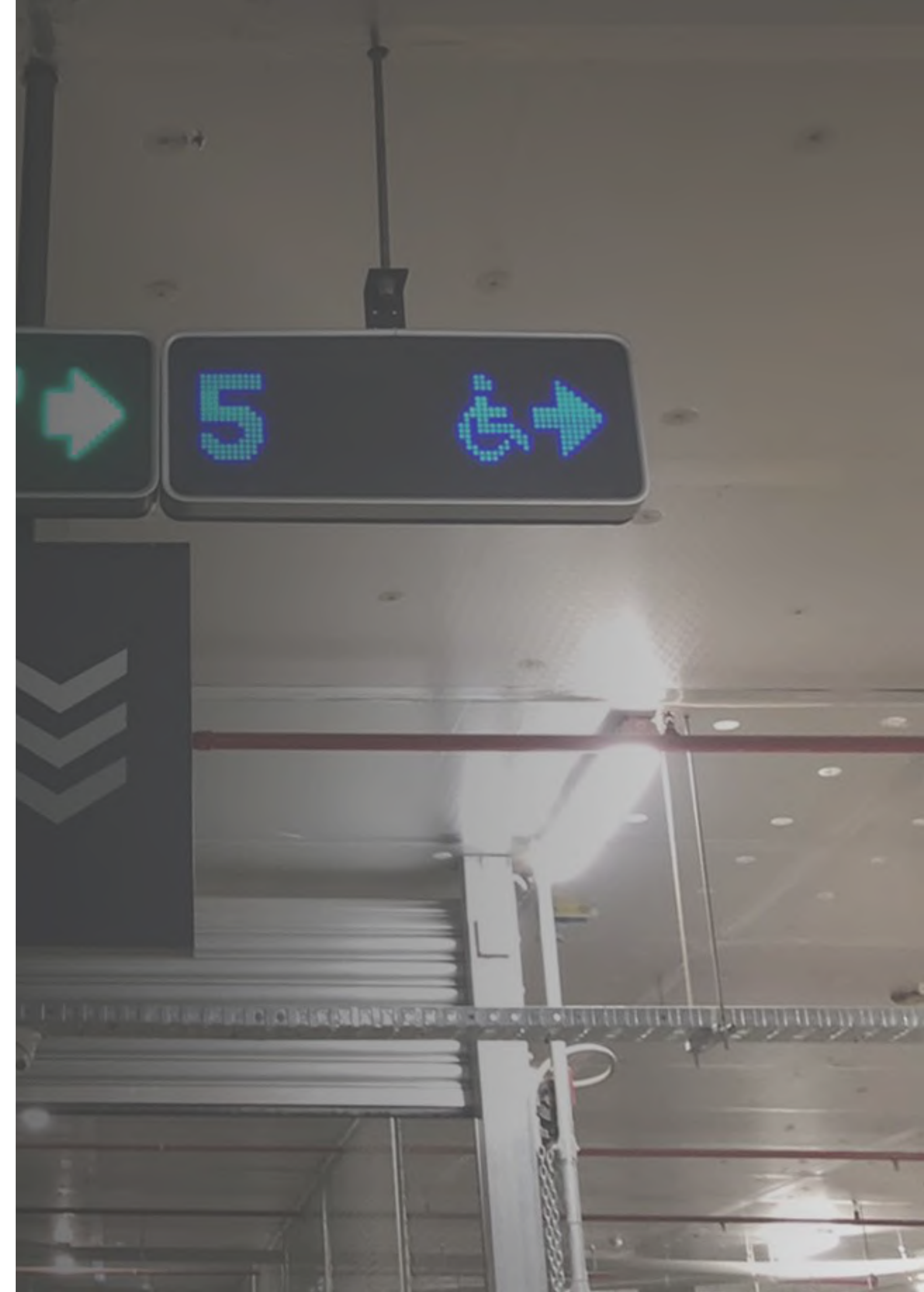- USB-COM-RS485 converter cable for communication with PC;
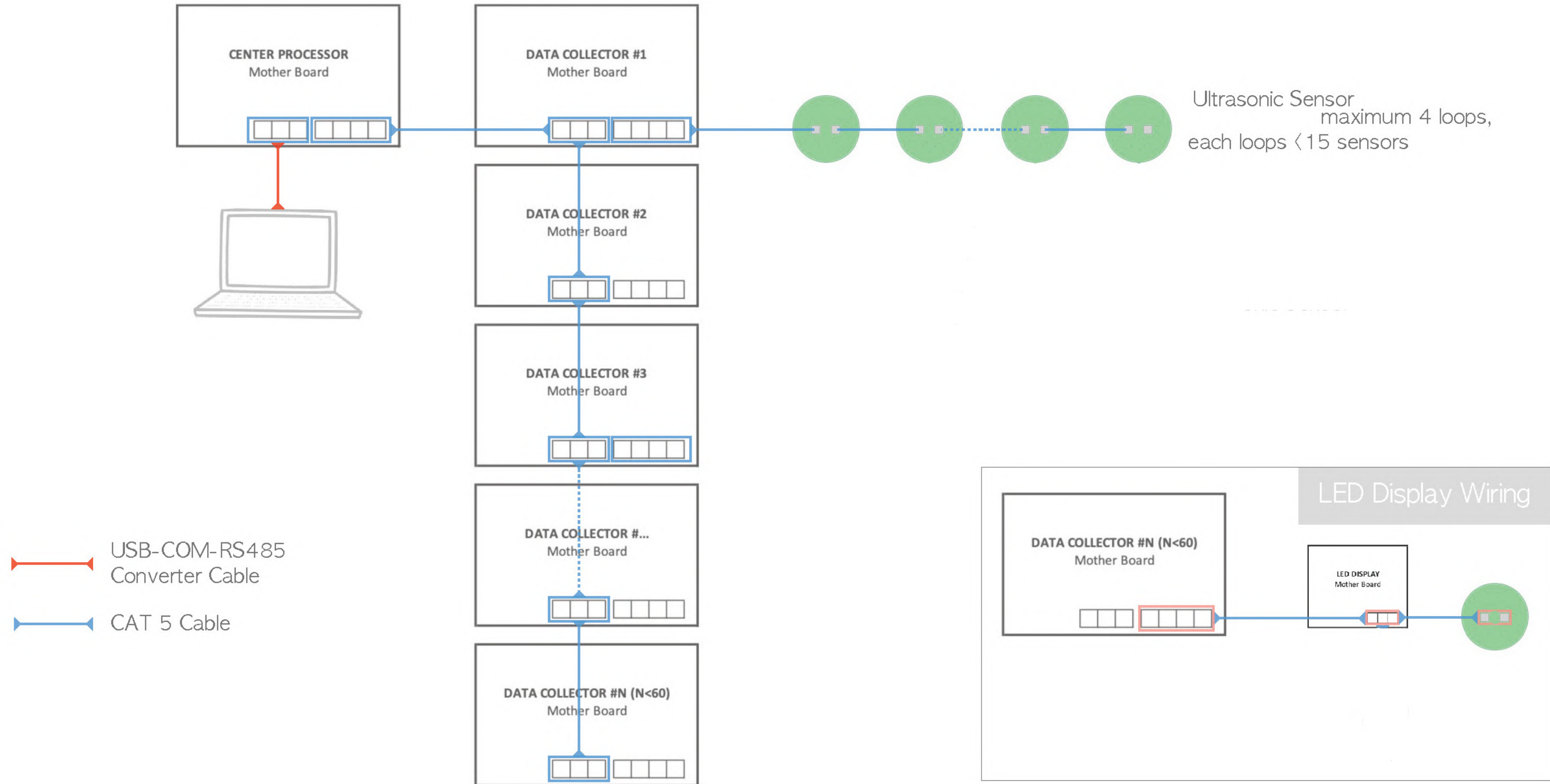
# Hardware Installation
## LED Display

LED Display position per CAD design. They can be wall mount or ceiling mount (comes with bracket) and we need 2 cables:

– Power Cable (RVV Single Cord 1.5mm*3) brings AC power to power up the device;

– CAT 5 (RJ45 on both sides, length per site requirement) runs RS485 data;

# Parking Guidance System Wiring Diagram

**CENTER PROCESSOR**
Mother Board

**DATA COLLECTOR #1**
Mother Board

Ultrasonic Sensor
maximum 4 loops,
each loops < 15 sensors

**DATA COLLECTOR #2**
Mother Board

**DATA COLLECTOR #3**
Mother Board

**DATA COLLECTOR #...**
Mother Board

LED Display Wiring

**DATA COLLECTOR #N (N<60)**
Mother Board

**LED DISPLAY**
Mother Board

USB-COM-RS485
Converter Cable

CAT 5 Cable

**DATA COLLECTOR #N (N<60)**
Mother Board

# Hardware Configuration
## General Introduction

All PGS hardware are pre-configured and well labeled. Therefore, configuration on site is not required (unless there is a mistake at factory or a change from customer after shipping.)

In the next few pages, you will find configuration instructions of each PGS components.

CAUTION: during installation, please have the workers recheck the configuration on the hardware device with config file provided.

# PARKING GUIDANCE SYSTEM CONFIGURATION TABLE

------ Total XXX Parking Spaces ------

| Total no. of space: | 11 | | Total no. of regular space: | 18 | | Total no. of handicap space: | 8 | | Sensor to ceiling distance: | 2.2 | | Sensor detect distance: | | | Distance DIP setup: | DIP setting |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

## Data Collector #1

| NCU# | Addr. | # of Space |
|---|---|---|
| #1 | 1 | 11 |

DIP Setting: 0 1 2 3 4 5 6 7

| Sensor | Addr. | Space# |
|---|---|---|
| Loop 1 (11) | 0 | 0 |
| | 1 | 1 |
| | 2 | 2 |
| | 3 | 3 |
| | 4 | 4 |
| | 5 | 5 |
| | 6 | 6 |
| | 7 | 7 |
| | 8 | 8 |
| | 9 | 9 |
| | 10 | 10 |
| | 11 | 11 |

Space# rows continue: 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60

| Display | Addr. | Links |
|---|---|---|
| #1 | 1 | below |

| Link# | NCU Addr. | linked sensor addr. |
|---|---|---|
| 1 | | |

## Data Collector #2

| NCU# | Addr. | # of Space |
|---|---|---|
| #2 | 2 | 36 |

DIP Setting: 0 1 2 3 4 5 6 7

| Sensor | Addr. | Space# |
|---|---|---|
| Loop 1 (8) | 0 | 0 |
| | 1 | 1 |
| | 2 | 2 |
| | 3 | 3 |
| | 4 | 4 |
| | 5 | 5 |
| | 6 | 6 |
| | 7 | 7 |
| | 8 | 8 |
| | 9 | 9 |
| | 10 | 10 |
| | 11 | 11 |
| | 12 | 12 |
| | 13 | 13 |
| | 14 | 14 |
| Loop 2 (10) | 15 | 15 |
| | 16 | 16 |
| | 17 | 17 |
| | 18 | 18 |

| Display | Addr. | Links |
|---|---|---|
| #2 | 1 | link #2 |

| Link# | NCU Addr. | linked sensor addr. |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |

## Data Collector #3

| NCU# | Addr. | # of Space |
|---|---|---|
| #3 | 3 | 46 |

DIP Setting: 0 1 2 3 4 5 6 7

| Sensor | Addr. | Space# |
|---|---|---|
| Loop 1 (8) | 0 | 0 |
| | 1 | 1 |
| | 2 | 2 |
| | 3 | 3 |
| | 4 | 4 |
| | 5 | 5 |
| | 6 | 6 |
| | 7 | 7 |

| Display | Addr. | Links |
|---|---|---|
| #3 | 1 | link #3 |

| Link# | NCU Addr. | linked sensor addr. |
|---|---|---|
| 1 | | |
| 2 | | |

## Data Collector #4

| NCU# | Addr. | # of Space |
|---|---|---|
| #4 | 4 | 46 |

DIP Setting: 0 1 2 3 4 5 6 7

| Sensor | Addr. | Space# |
|---|---|---|

## Data Collector #5

| NCU# | Addr. | # of Space |
|---|---|---|
| #5 | 5 | 46 |

DIP Setting: 0 1 2 3 4 5 6 7

| Sensor | Addr. | Space# |
|---|---|---|

## Data Collector #6

| NCU# | Addr. | # of Space |
|---|---|---|
| #6 | 6 | 46 |

DIP Setting: 0 1 2 3 4 5 6 7

| Sensor | Addr. | Space# |
|---|---|---|

# Hardware Configuration
## CAT 5 Pin Definition

CAT 5 Cable in Paring Guidance System carries both data and power (DC24V), PIN definition as below:

| PIN | Color | Definition |
|-----|-------|------------|
| 1 | Half Orange | DC24V+ |
| 2 | Orange | DC24V+ |
| 3 | Half Green | DC24V- |
| 4 | Blue | DC24V- |
| 5 | Half Blue | GND |
| 6 | Green | N/A |
| 7 | Half Brown | RS485-1 |
| 8 | Brown | RS485-2 |
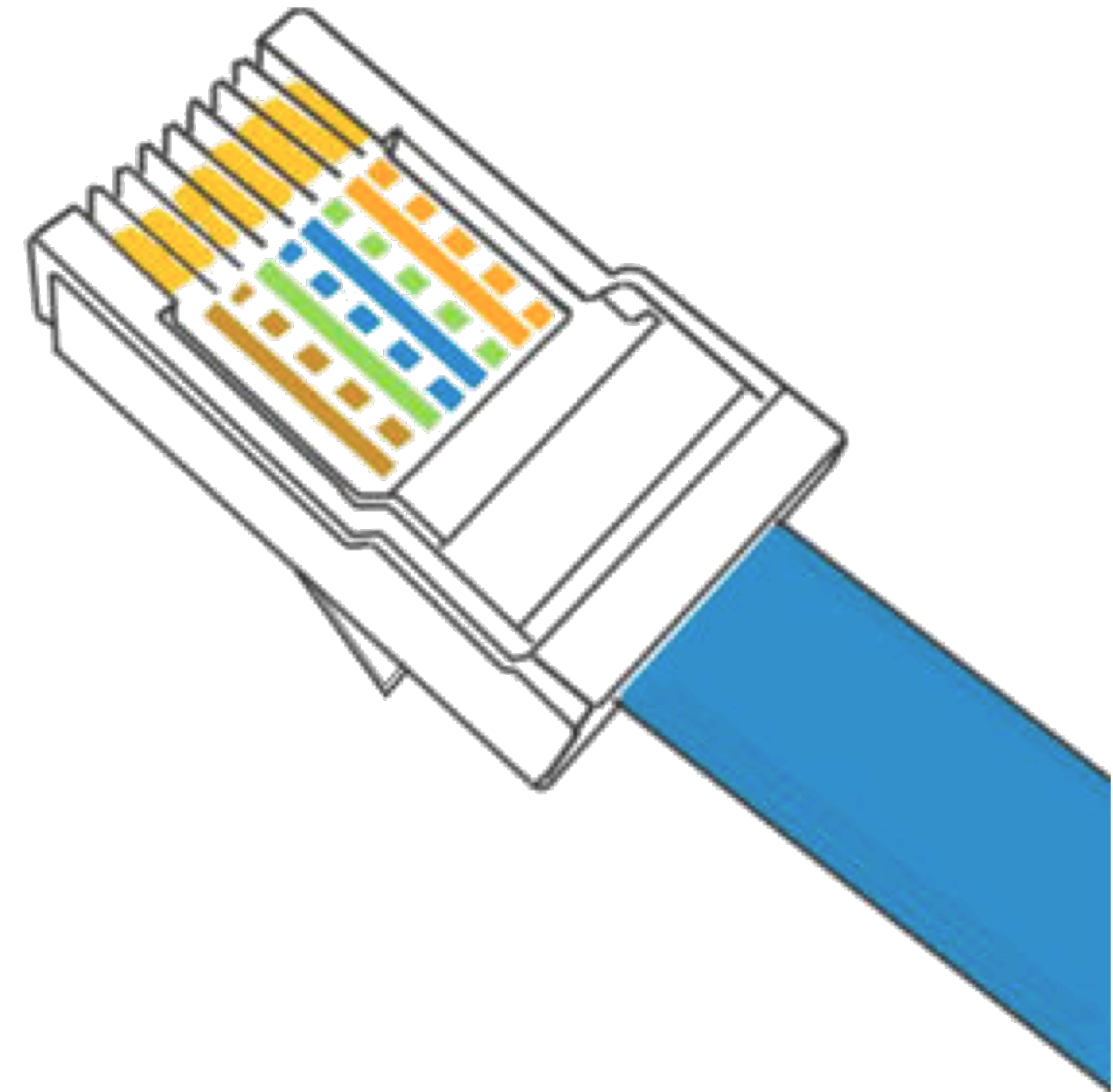
# Hardware Configuration
## Ultrasonic Sensor



There are 2 main configuration for PGS sensor: Detection Distance (7X DIPs) & Physical Address (6X DIPs).

Detection Distance:

| DIP | Purpose | Normal State |
|---|---|---|
| #1 | | |
| #2 | SENSOR Distance Setup | Set up per site situation refer to table on the right → |
| #3 | | |
| #4 | | |
| #5 | Detection Distance Setup | Set up per site situation refer to table on the right → |
| #6 | | |
| #7 | | OFF |

| DIP State White: Off Black: On | | | | INSTALLATION Distance |
|---|---|---|---|---|
| 4 | 5 | 6 | 7 | |
|  |  |  |  | 1.8–1.89M |
|  |  | ■ |  | 1.9–1.99M |
|  | ■ |  |  | 2.0–2.09M |
|  | ■ | ■ |  | 2.1–2.29M |
| ■ |  |  |  | 2.3–2.59M |
| ■ |  | ■ |  | 2.6–2.99M |
| ■ | ■ |  |  | 3.0–3.20M |
| ■ | ■ | ■ |  | Max |

| 3 2 1 | Detection Range |
|---|---|
| 0 0 0 | Remain |
| 0 0 1 | 1.9 - 2.0 m |
| 0 1 0 | 2.0 - 2.2 m |
| 0 1 1 | 2.2 - 2.4 m |
| 1 0 0 | 2.4 - 2.6 m |
| 1 0 1 | 2.6 - 3.0 m |
| 1 1 0 | 3.0 - 3.5 m |
| 1 1 1 | max |

# Hardware Configuration
## Ultrasonic Sensor
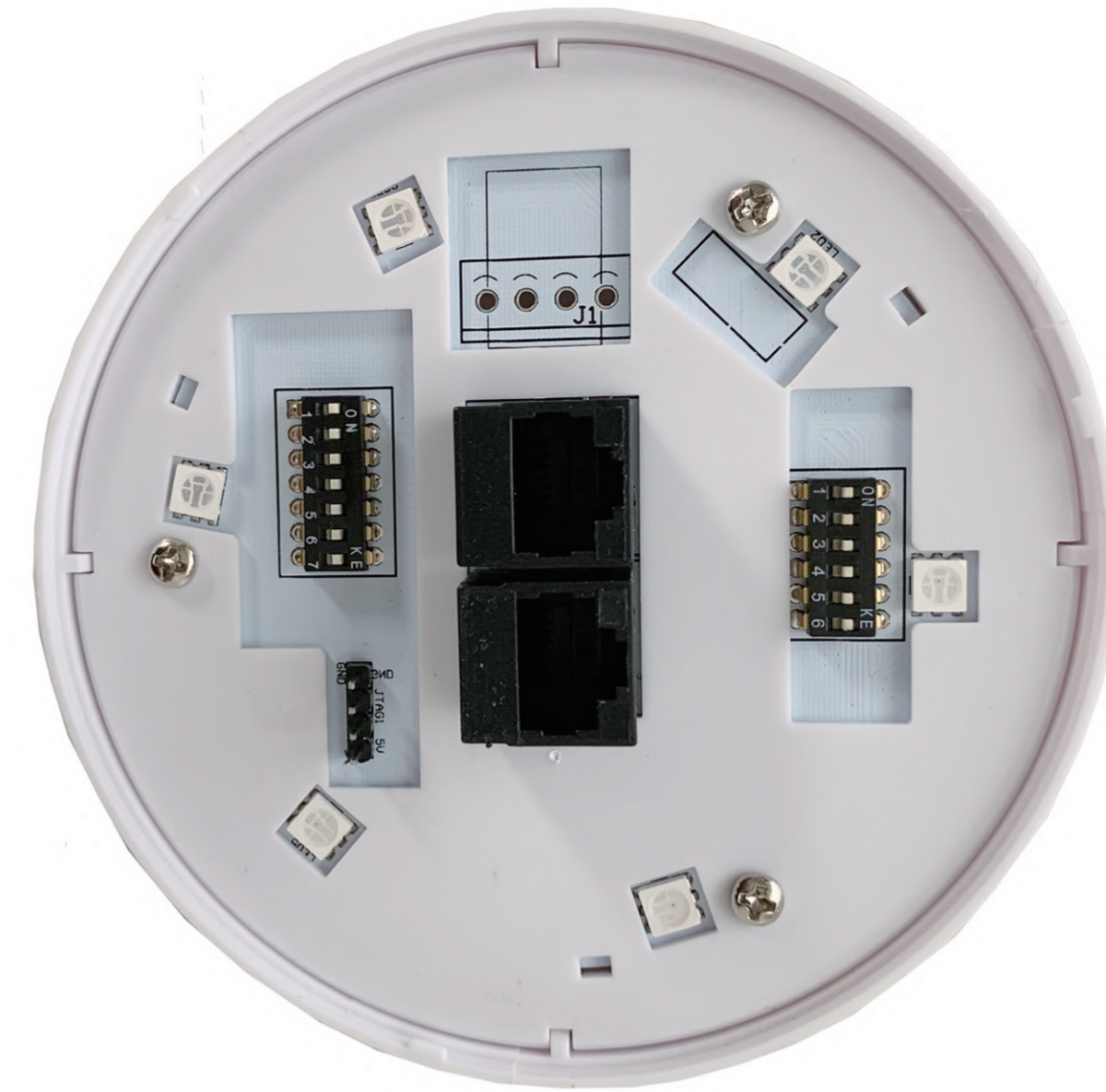
Physical Address:



| DIP State White: Off Black: On | | | | | | Addr. |
|---|---|---|---|---|---|---|
| 6 | 5 | 4 | 3 | 2 | 1 | |
| □ | □ | □ | □ | □ | □ | 0 |
| □ | □ | □ | □ | □ | ■ | 1 |
| □ | □ | □ | □ | ■ | □ | 2 |
| □ | □ | □ | □ | ■ | ■ | 3 |
| □ | □ | □ | ■ | □ | □ | 4 |
| □ | □ | □ | ■ | □ | ■ | 5 |
| □ | □ | □ | ■ | ■ | □ | 6 |
| □ | □ | □ | ■ | ■ | ■ | 7 |
| □ | □ | ■ | □ | □ | □ | 8 |
| □ | □ | ■ | □ | □ | ■ | 9 |

| DIP State White: Off Black: On | | | | | | Addr. |
|---|---|---|---|---|---|---|
| 6 | 5 | 4 | 3 | 2 | 1 | |
| □ | □ | ■ | □ | ■ | □ | 10 |
| □ | □ | ■ | □ | ■ | ■ | 11 |
| □ | □ | ■ | ■ | □ | □ | 12 |
| □ | □ | ■ | ■ | □ | ■ | 13 |
| □ | □ | ■ | ■ | ■ | □ | 14 |
| □ | □ | ■ | ■ | ■ | ■ | 15 |
| □ | ■ | □ | □ | □ | □ | 16 |
| □ | ■ | □ | □ | □ | ■ | 17 |
| □ | ■ | □ | □ | ■ | □ | 18 |
| □ | ■ | □ | □ | ■ | ■ | 19 |

| DIP State White: Off Black: On | | | | | | Addr. |
|---|---|---|---|---|---|---|
| 6 | 5 | 4 | 3 | 2 | 1 | |
| □ | ■ | □ | ■ | □ | □ | 20 |
| □ | ■ | □ | ■ | □ | ■ | 21 |
| □ | ■ | □ | ■ | ■ | □ | 22 |
| □ | ■ | □ | ■ | ■ | ■ | 23 |
| □ | ■ | ■ | □ | □ | □ | 24 |
| □ | ■ | ■ | □ | □ | ■ | 25 |
| □ | ■ | ■ | □ | ■ | □ | 26 |
| □ | ■ | ■ | □ | ■ | ■ | 27 |
| □ | ■ | ■ | ■ | □ | □ | 28 |
| □ | ■ | ■ | ■ | □ | ■ | 29 |

| DIP State White: Off Black: On | | | | | | Addr. |
|---|---|---|---|---|---|---|
| 6 | 5 | 4 | 3 | 2 | 1 | |
| □ | ■ | ■ | ■ | ■ | □ | 30 |
| □ | ■ | ■ | ■ | ■ | ■ | 31 |
| ■ | □ | □ | □ | □ | □ | 32 |
| ■ | □ | □ | □ | □ | ■ | 33 |
| ■ | □ | □ | □ | ■ | □ | 34 |
| ■ | □ | □ | □ | ■ | ■ | 35 |
| ■ | □ | □ | ■ | □ | □ | 36 |
| ■ | □ | □ | ■ | □ | ■ | 37 |
| ■ | □ | □ | ■ | ■ | □ | 38 |
| ■ | □ | □ | ■ | ■ | ■ | 39 |

| DIP State White: Off Black: On | | | | | | Addr. |
|---|---|---|---|---|---|---|
| 6 | 5 | 4 | 3 | 2 | 1 | |
| ■ | □ | ■ | □ | □ | □ | 40 |
| ■ | □ | ■ | □ | □ | ■ | 41 |
| ■ | □ | ■ | □ | ■ | □ | 42 |
| ■ | □ | ■ | □ | ■ | ■ | 43 |
| ■ | □ | ■ | ■ | □ | □ | 44 |
| ■ | □ | ■ | ■ | □ | ■ | 45 |
| ■ | □ | ■ | ■ | ■ | □ | 46 |
| ■ | □ | ■ | ■ | ■ | ■ | 47 |
| ■ | ■ | □ | □ | □ | □ | 48 |
| ■ | ■ | □ | □ | □ | ■ | 49 |

| DIP State White: Off Black: On | | | | | | Addr. |
|---|---|---|---|---|---|---|
| 6 | 5 | 4 | 3 | 2 | 1 | |
| ■ | ■ | □ | □ | ■ | □ | 50 |
| ■ | ■ | □ | □ | ■ | ■ | 51 |
| ■ | ■ | □ | ■ | □ | □ | 52 |
| ■ | ■ | □ | ■ | □ | ■ | 53 |
| ■ | ■ | □ | ■ | ■ | □ | 54 |
| ■ | ■ | □ | ■ | ■ | ■ | 55 |
| ■ | ■ | ■ | □ | □ | □ | 56 |
| ■ | ■ | ■ | □ | □ | ■ | 57 |
| ■ | ■ | ■ | □ | ■ | □ | 58 |
| ■ | ■ | ■ | □ | ■ | ■ | 59 |

# Hardware Configuration
## Data Collector

The only configuration on NCU is the Physical Address, normally we started from address 1 in PGS system:

| DIP State White: Off / Black: On | | | | | | | | Physical Address |
|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| ■ | □ | | | | | | | 1 |
| □ | ■ | | | | | | | 2 |
| ■ | ■ | □ | | | | | | 3 |
| | | ■ | | | | | | 4 |
| ■ | □ | ■ | | | | | | 5 |
| □ | ■ | ■ | | | | | | 6 |

# Hardware Configuration
## LED Display

The only configuration on LED display is the Physical Address, normally we started from address 1 in PGS system:

| DIP State White: Off / Black: On | | | | | | | | Physical Address |
|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| ■ | | | | | | | | 1 |
| | ■ | | | | | | | 2 |
| ■ | ■ | | | | | | | 3 |

# Commissioning & Debugging
## General Instructions

A properly installed and configured PGS system shall provide accurate data on both the software as well as the LED display signs and direct drivers to park. All Number, Arrow Direction, Format etc. shown be in strict accordance with design.

CAUTIONS：

please make sure all connections are strictly in accordance with the wiring diagram.

please have the workers recheck the configuration on the hardware device with config file provided during installation；

please make sure all components are installed at the right spot per design；
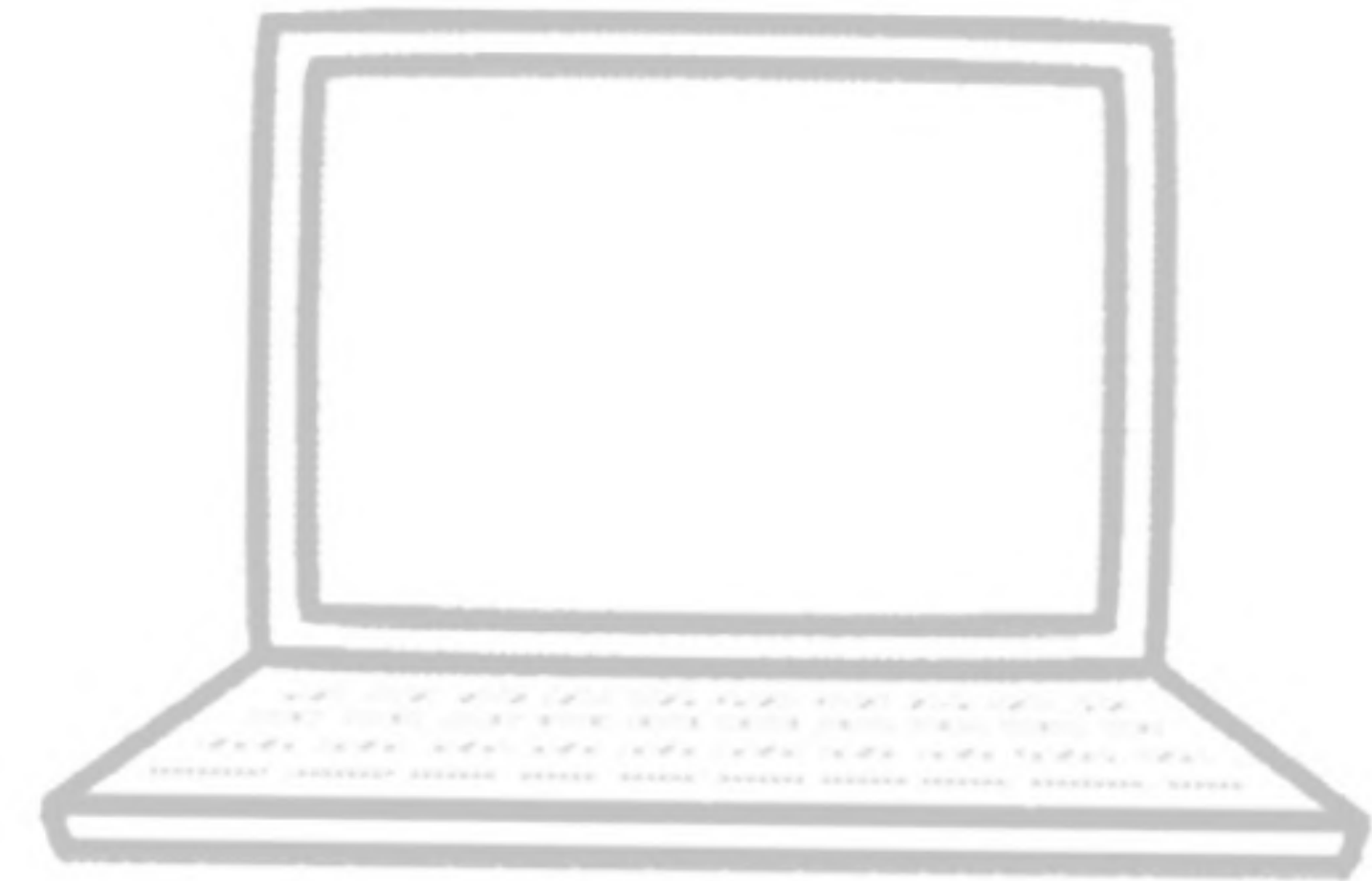
# Commissioning & Debugging
## PC Communication

Key point: when the PGS system is properly connected to PC via RS485 to RS232 Converter, and relevant COM Port open, the information on the Software must be updated at the mean time. If the info does not update, there's no communication between Centre Processor and PC, the problem can be:

- RS485 to RS232 Converter Problem replace the converter and try again

- COM Port Setup Problem: set up COM Port according to the software user manual

# Commissioning & Debugging
## Center Processor

Key point: on the LCD Display of Center Processor, all Data Collector (been connected) status must show "OK", indicating its communication with PGS system is normal.

- If all the status is "XX", means there is a problem. Please test Centre Processor with one normal Data Collector; if the status on Centre Processor LCD Display is OK, test the Data Collectors one by one from the nearest to farthest; if status on Centre Processor LCD Display remains XX, replace Centre Processor with a new one.

- If only some connected Data Collector status is XX, there's no communication between Centre Processor and the XX Data Collector, and the possibilities are:

- Repeated Physical Address: check all Data Collector; make sure all physical addresses are sole and unique;

- Data Collector RG45 Problem: replace the mainboard

- Cable Problem: if the problem remains after mainboard replaced, please test the cable, it probably is the cause of the problem,

# Commissioning & Debugging
## Data Collector

Key point: GREEN status lights on Data Collectors must be twinkling, indicating its communication with system. If the GREEN status light is static, there's no communication between Data Collector and sensors, and possible issues are:

- Data Collector Problem: test Data Collector with a normal working sensor, if the GREEN on Data Collector is twinkling, means the Data Collector is good; if the GREEN remains static, something is wrong with the Data Collector, please replace with a new one.

- Ultrasonic Sensor or CAT 5 Cable Problem: test the sensors & cable one by one from the nearest sensor to the farthest;

# Commissioning & Debugging
## LED Display

Key points: information shown on the LED Display must be in RED, GREEN or BLUE color, which means the communication with PGS system is normal; if the color is ORANGE, means there's no communication between the LED Display and the system, possible issue are:

- Wrong Physical Address: check physical address, should be the same as in the config file;

- LED Controller Problem: replace LED Controller and try again

- Cable Problem: replace the CAT 5 cable and try again

# After-sale Support

Our support including online and on-site support.

Normally, remote support is enough for PGS installation, our team will be happy to help and it's free of charge;

When a on-site support is mandatory, customers shall make appointment with our technical team, and all traveling costs are to be covered by customer side.



Technical Support

—————— The End ——————