



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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System Introduction

Parking Guidance System

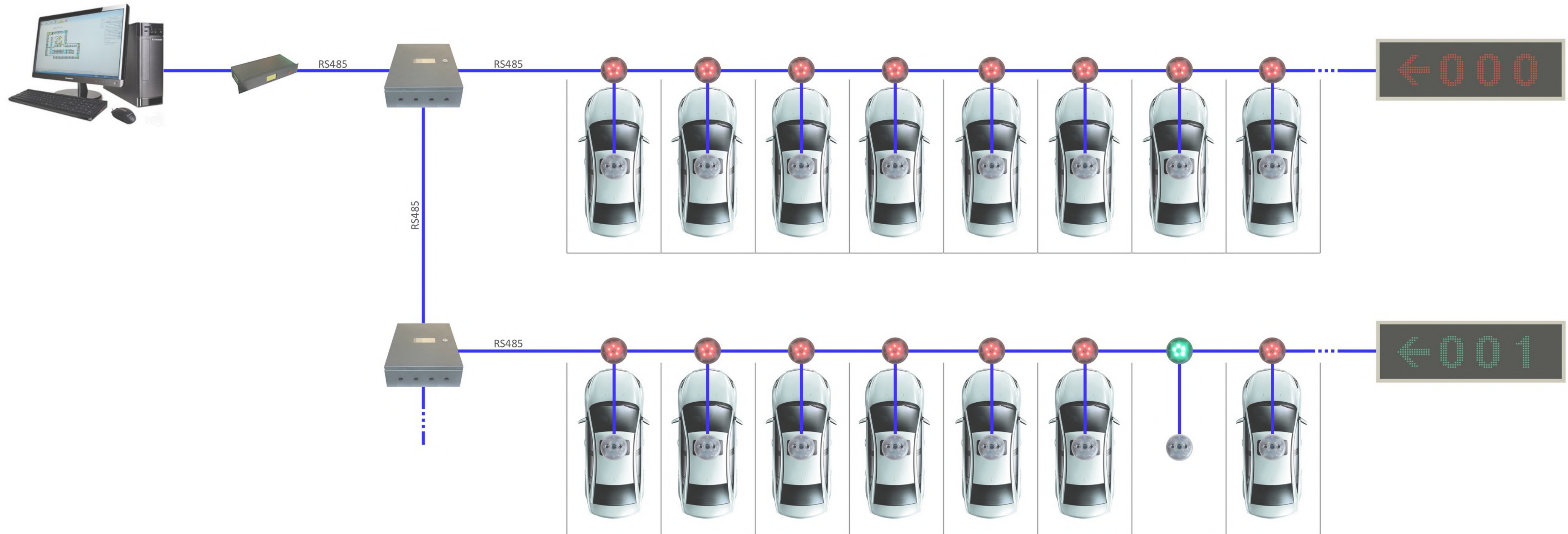
Parking Guidance System is an electronic system benefits drivers, car park management and society. The design concept is to pinpoint available parking spaces and direct drivers to park within shortest time, and maximize facility usage.

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



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.



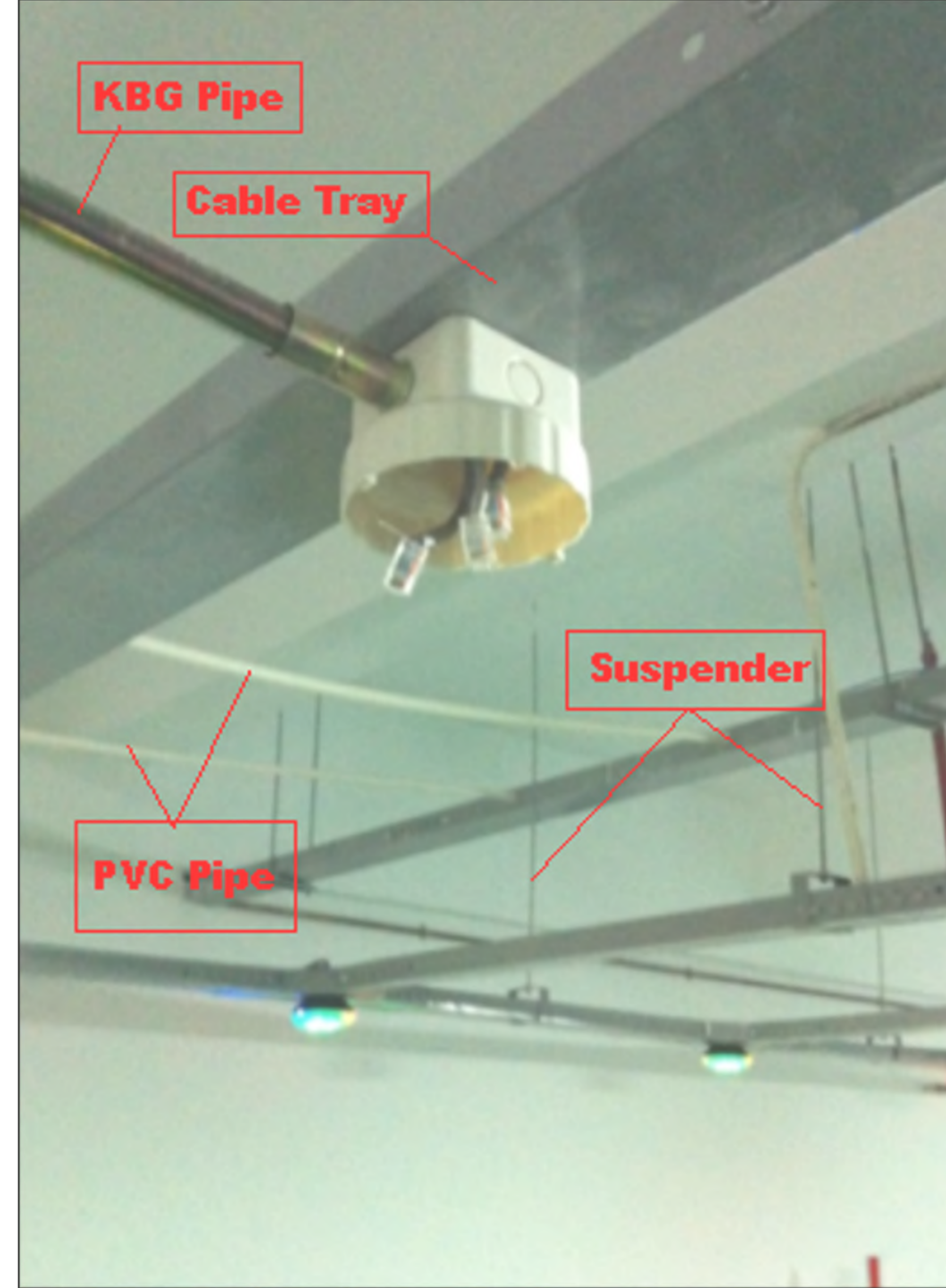
Pre-cabling Instructions

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.

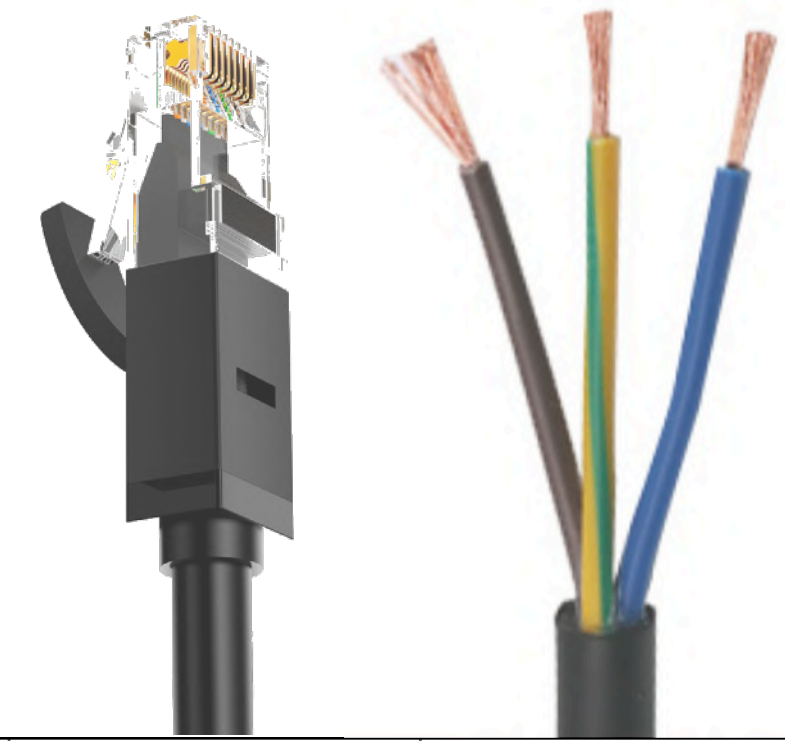
To make life easier for customer and ourself, all hardware components are pre-configured and well labelled, once they arrive to site, workers simply following the label info and put them to the right position, no need extra configuration to do.

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

Sensor & Indicator

Sensor and indicators are to be installed to each parking spaces - sensor to the upper middle position of the parking spaces, and indicator to the upper front position. At pre-cabling stage, the back cover boxes are already installed, so the remaining are only two jobs after finding the right spot for the sensor/indicator:

- plug in the CAT 5 cable properly
- buckle up the sensor/indicator

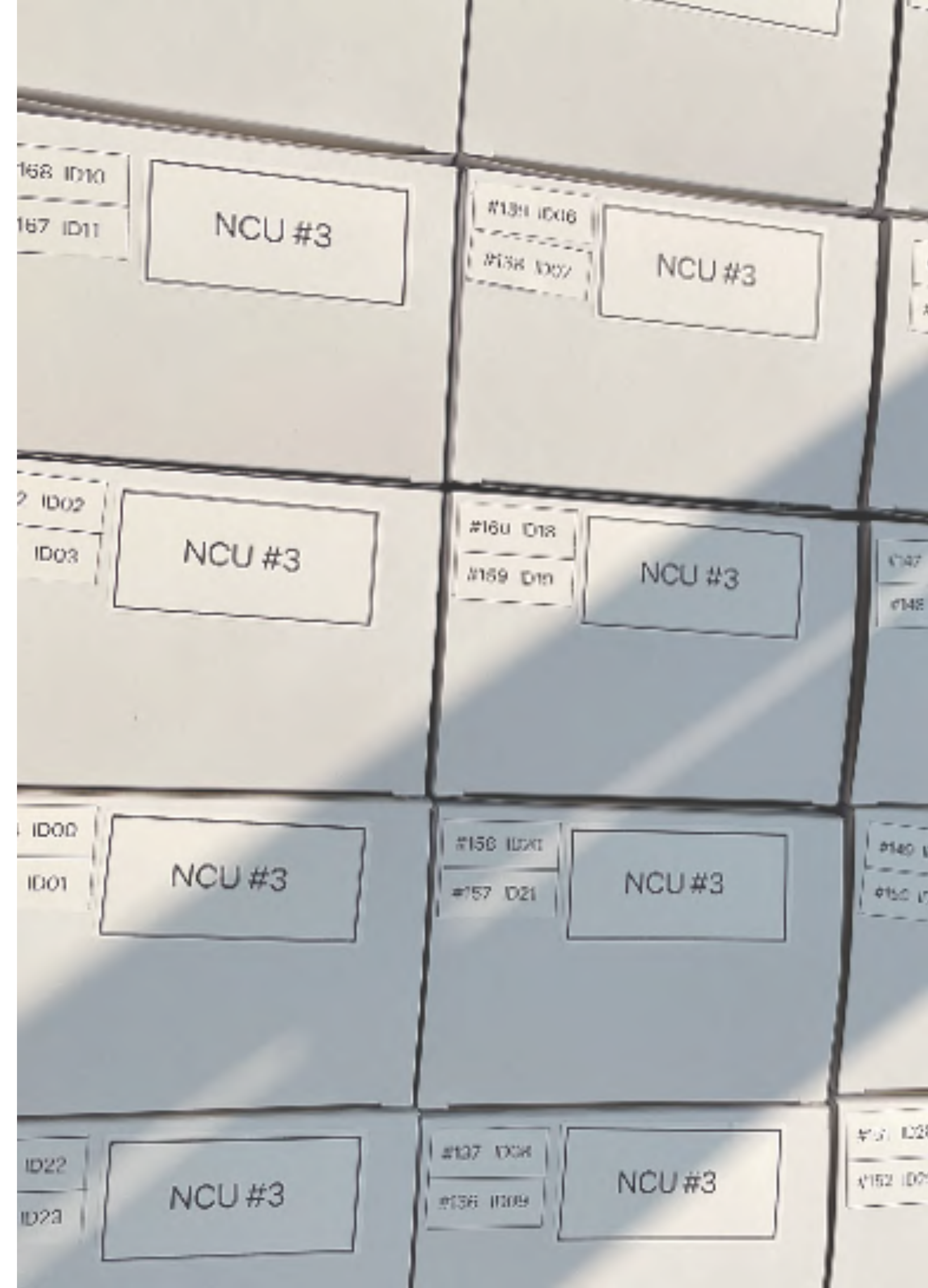


Hardware Installation

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;

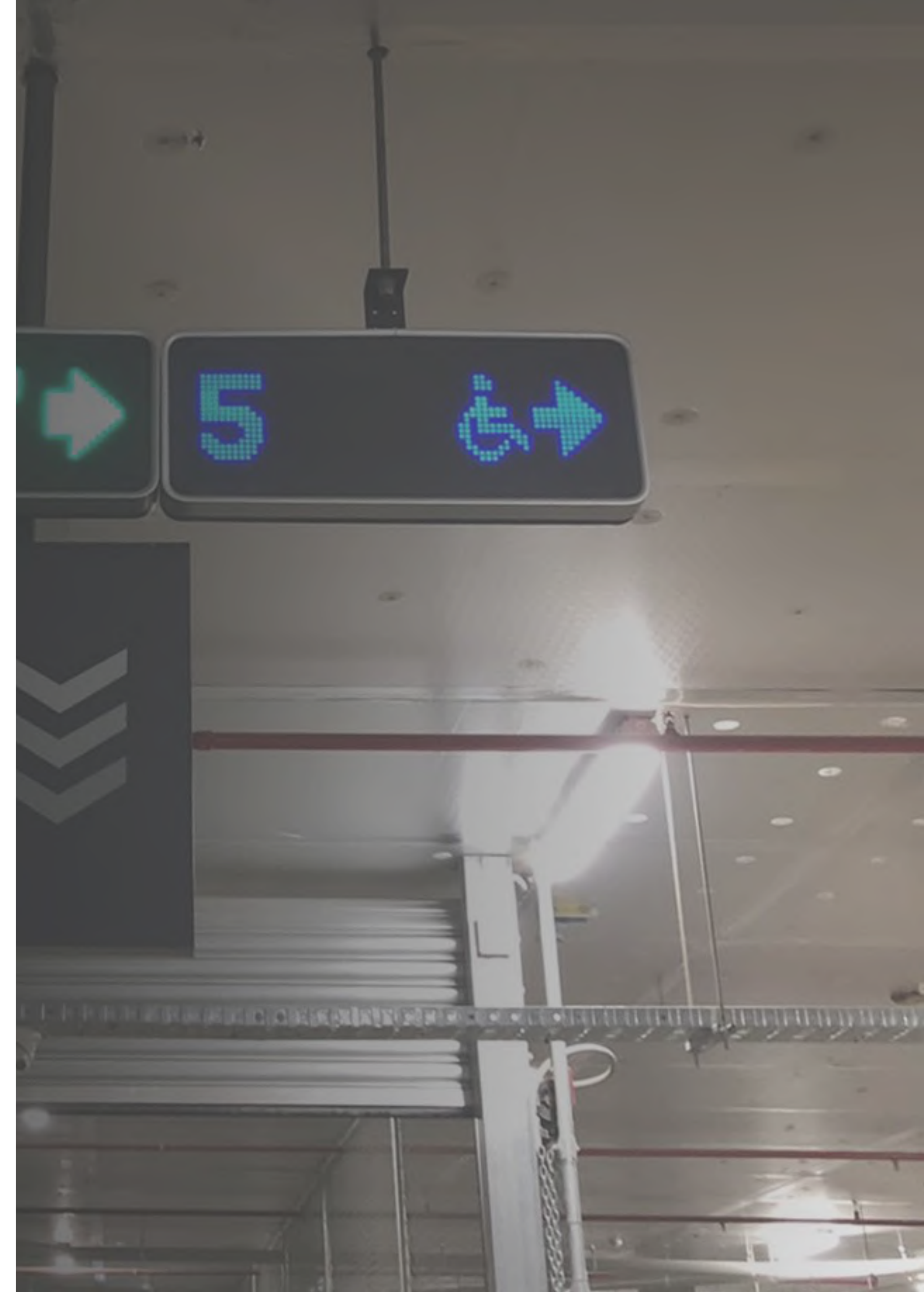


Hardware Installation

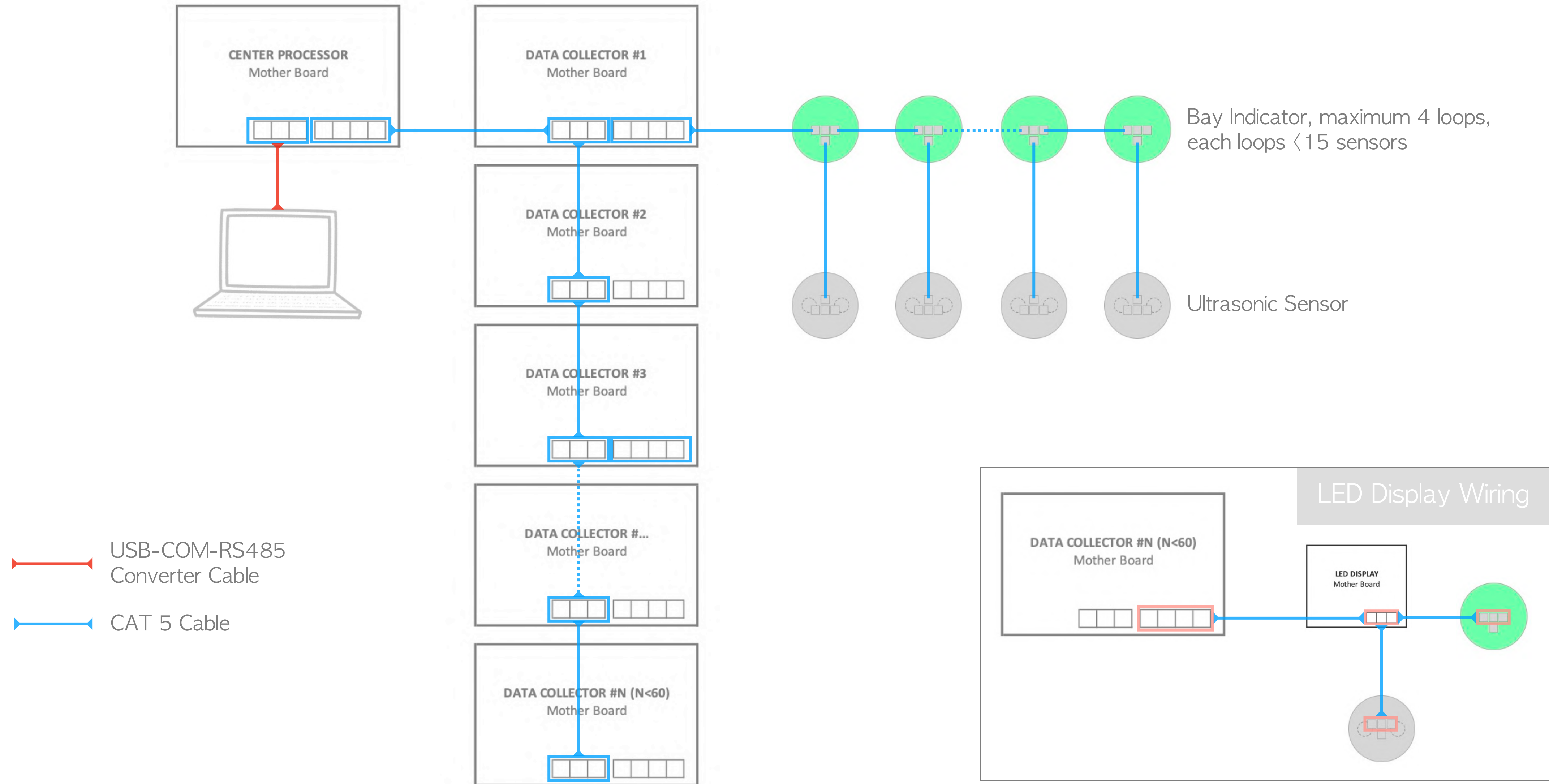
LED Display

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



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 253 Parking Spaces -----

Total no. of space:	253
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Total no. of regular space:	250
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Total no. of handicap space:	3
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Sensor to ceiling distance:	2.4m??
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Sensor detect distance:	
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Distance DIP setup:	<table border="1" style="font-size: small;"> <tr><th colspan="7">DIP setting</th></tr> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr> <tr><td style="background-color: #0000FF;"></td><td style="background-color: #0000FF;"></td><td style="background-color: #0000FF;"></td><td style="background-color: #0000FF;"></td><td style="background-color: #0000FF;"></td><td style="background-color: #0000FF;"></td><td style="background-color: #0000FF;"></td></tr> </table>	DIP setting							1	2	3	4	5	6	7							
DIP setting																						
1	2	3	4	5	6	7																

Data Collector #1

NCU#	Addr.	# of Space
#1	1	52

DIP Setting							
0	1	2	3	4	5	6	7

Sensor	Addr.	Space#
Loop 1 (14)	0	82
	1	83
	2	84
	3	56
	4	57
	5	58
	6	59
	7	49
	8	50
	9	51
	10	52
	11	53
	12	54
	13	55
Loop 2 (15)	14	81
	15	80
	16	79
	17	78
	18	77
	19	76
	20	75
	21	74
	22	73
	23	72
	24	71
	25	70
	26	96
	27	97
	28	98
Loop 3 (11)	29	59a
	30	60
	31	61
	32	62
	33	63
	34	64
	35	65
	36	66
	37	67
	38	68
	39	69
Loop 4 (12)	40	48
	41	47
	42	46
	43	45
	44	44
	45	43
	46	42
	47	41
	48	40
	49	39
	50	38
	51	37

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 (12)	0	109
	1	110
	2	111
	3	112
	4	113
	5	114
	6	115
	7	116
	8	117
	9	118
	10	119
	11	120
Loop 2 (11)	12	102
	13	101
	14	100
	15	99
	16	95
	17	94
	18	93
	19	92
	20	91
	21	90
	22	89
Loop 3 (7)	23	103
	24	104
	25	105
	26	88
	27	87
	28	86
	29	85
Loop 4 (6)	30	108
	31	107
	32	106
	33	135
	34	134
	35	133

Display	Addr.	Links
#2	1	link #1
#3	2	link #2
#4	3	link #3

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 (10)	0	144
	1	143
	2	142
	3	141
	4	140a
	5	140b
	6	139
	7	138
	8	137
	9	136
Loop 2 (12)	10	168
	11	167
	12	166
	13	165
	14	164
	15	163
	16	162
	17	161
	18	160
	19	159
	20	158
	21	157
Loop 3 (12)	22	145
	23	146
	24	147
	25	148
	26	149
	27	150
	28	151
	29	152
	30	153
	31	154
	32	155
	33	156
Loop 4 (12)	34	132
	35	131
	36	130
	37	129
	38	128
	39	127
	40	126
	41	125
	42	124
	43	123
	44	122
	45	121

Display	Addr.	Links
#5	1	link #1
#6	2	link #2

Link#	NCU Addr.	linked sensor addr.
1		
2		

Data Collector #4

NCU#	Addr.	# of Space
#4	4	32

DIP Setting							
0	1	2	3	4	5	6	7

Sensor	Addr.	Space#
Loop 1 (8)	0	193
	1	194
	2	195
	3	196
	4	197
	5	198
	6	200
	7	201
Loop 2 (11)	8	192
	9	191
	10	190
	11	189
	12	188
	13	187
	14	186
	15	185
	16	184
	17	183
	18	182
Loop 3 (10)	19	172
	20	173
	21	174
	22	175
	23	176
	24	177
	25	178
	26	179
	27	180
	28	181
Loop 4 (3)	29	171
	30	170
	31	169

Data Collector #5

NCU#	Addr.	# of Space
#5	5	51

DIP Setting							
0	1	2	3	4	5	6	7

Sensor	Addr.	Space#
Loop 1 (14)	0	216
	1	217
	2	218
	3	219
	4	220
	5	221
	6	222
	7	223
	8	224
	9	225
	10	226
	11	227
	12	228
	13	229
Loop 2 (15)	14	244
	15	243
	16	242
	17	241
	18	240
	19	239
	20	238
	21	237
	22	236
	23	235
	24	234
	25	233
	26	232
	27	231
	28	230
Loop 3 (8)	29	245
	30	246
	31	247
	32	248
	33	249
	34	250
	35	251
	36	252
	37	215
	38	214
	39	213
	40	212
	41	211
Loop 4 (13)	42	210
	43	209
	44	208
	45	207
	46	206
	47	205
	48	204
	49	203
	50	202

Display	Addr.	Links
#7	1	link #1

Link#	NCU Addr.	linked sensor addr.
1		

Data Collector #6

NCU#	Addr.	# of Space
#6	6	36

DIP Setting							
0	1	2	3	4	5	6	7

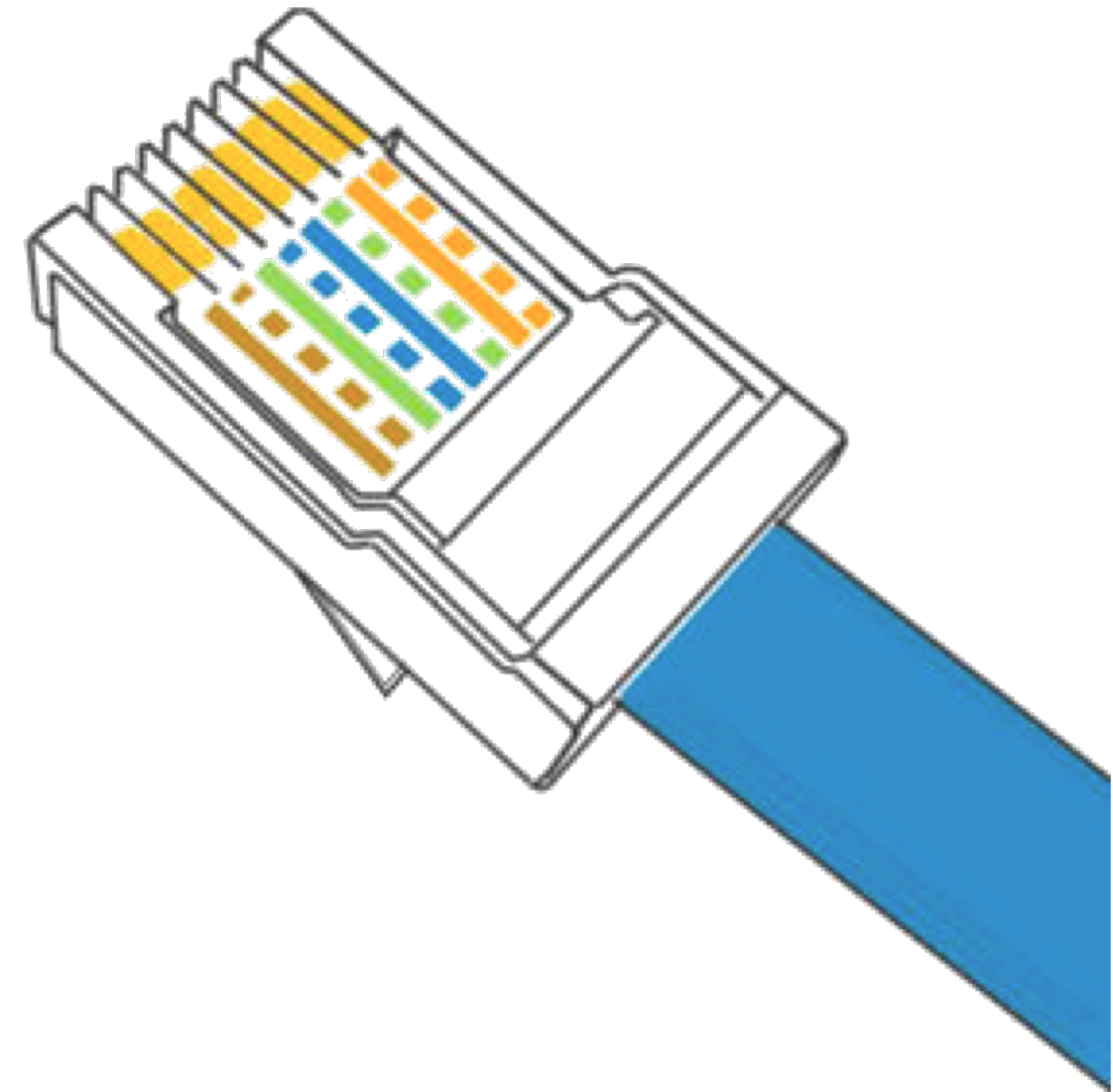
Sensor	Addr.	Space#
Loop 1 (14)	0	14
	1	13
	2	12
	3	11
	4	10
	5	9
	6	8
	7	7
	8	6
	9	5
	10	4
	11	3
	12	2
	13	1
Loop 2 (15)	14	15
	15	16
	16	17
	17	18
	18	19
	19	20
	20	21
	21	22
	22	23
	23	24
	24	25
	25	26
	26	27
	27	28
	28	29
Loop 3 (10)	29	30
	30	31
	31	32
	32	33
	33	34
	34	35
	35	36

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	
3	Half Green	DC24V-
4	Blue	
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	Detection Mode Selection On/Off=New/Old Mode	ON
#2	Anti Interference Level On/Off=Weak/Strong	OFF
#3	Floor Condition Type On/Off=Smooth/Rough	OFF
#4	Detection Distance Setup	Set up per site situation refer to table on the right →
#5		
#6		
#7		

DIP State White: Off Black: On				Detection Distance
4	5	6	7	
				1.2~1.5
		■		1.6~2
	■			2.1~2.5
	■	■		2.6~3
■			■	3.1~3.5
■		■		3.6~3.9
■	■			3.9~4.3
■	■	■		Max

Hardware Configuration

Ultrasonic Sensor



Physical Address:

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

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

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

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

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

DIP State White: Off Black: On						Addr.
1	2	3	4	5	6	
						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	
Black	White	White	White	White	White	White	White	1
White	Black	White	White	White	White	White	White	2
Black	Black	White	White	White	White	White	White	3
White	White	Black	White	White	White	White	White	4
Black	White	Black	White	White	White	White	White	5
White	Black	Black	White	White	White	White	White	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	
Black	White	White	White	White	White	White	White	1
White	Black	White	White	White	White	White	White	2
Black	Black	White	White	White	White	White	White	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 ————