

PDC Series

Service Manual

(English)

2017. 05. 19



Table of Contents

1. Introduction	3
1.1. Preface.....	3
1.2. Precaution	3
2. Classification	4
2.1. Overall View.....	4
2.2. Specifications	5
2.3. Display & Key	6
2.3.1. Display.....	오류! 책갈피가 정의되어 있지 않습니다.
2.3.2. Key Function	6
2.4. Dimension	오류! 책갈피가 정의되어 있지 않습니다.
2.4.1. Scale	오류! 책갈피가 정의되어 있지 않습니다.
2.4.2. Loadcell	오류! 책갈피가 정의되어 있지 않습니다.
2.5. Sealing Method.....	오류! 책갈피가 정의되어 있지 않습니다.
3. Calibration	7
3.1. Calibration Mode	7
3.2. Span Calibration	오류! 책갈피가 정의되어 있지 않습니다.
4. The Schematics and Diagram.....	11
4.1. System Block Diagram.....	11
4.2. Circuit Diagram	11
4.3. Interface	오류! 책갈피가 정의되어 있지 않습니다.
4.3.1. RS232C Interface (direct).....	11
4.3.2. USB Interface	15
5. Firmware Update Method	15
6. Exploded Views.....	16
7. Parts List	오류! 책갈피가 정의되어 있지 않습니다.
7.1. Electronic Parts.....	오류! 책갈피가 정의되어 있지 않습니다.
7.2. Mechanical Parts.....	오류! 책갈피가 정의되어 있지 않습니다.
7.2.1. BODY ASS'Y	오류! 책갈피가 정의되어 있지 않습니다.
7.2.2. UPPER CASE ASS'Y.....	오류! 책갈피가 정의되어 있지 않습니다.
7.2.3. TRAY ASS'Y	오류! 책갈피가 정의되어 있지 않습니다.
7.2.4. IMAGE ASS'Y.....	오류! 책갈피가 정의되어 있지 않습니다.
7.2.5. PLATFORM ASS'Y.....	오류! 책갈피가 정의되어 있지 않습니다.
7.2.6. C/T ASS'Y	오류! 책갈피가 정의되어 있지 않습니다.
7.2.7. Loadcell Parts	오류! 책갈피가 정의되어 있지 않습니다.
Revision	오류! 책갈피가 정의되어 있지 않습니다.

1. Introduction

1.1. Preface

Thank you for purchasing of our CAS scale.

This scale has been designed with CAS reliability, under rigid quality control and with outstanding performance.

WE hope that your departments enjoy with high quality of CAS product.

This manual will help you with proper operations and care of the PDC.

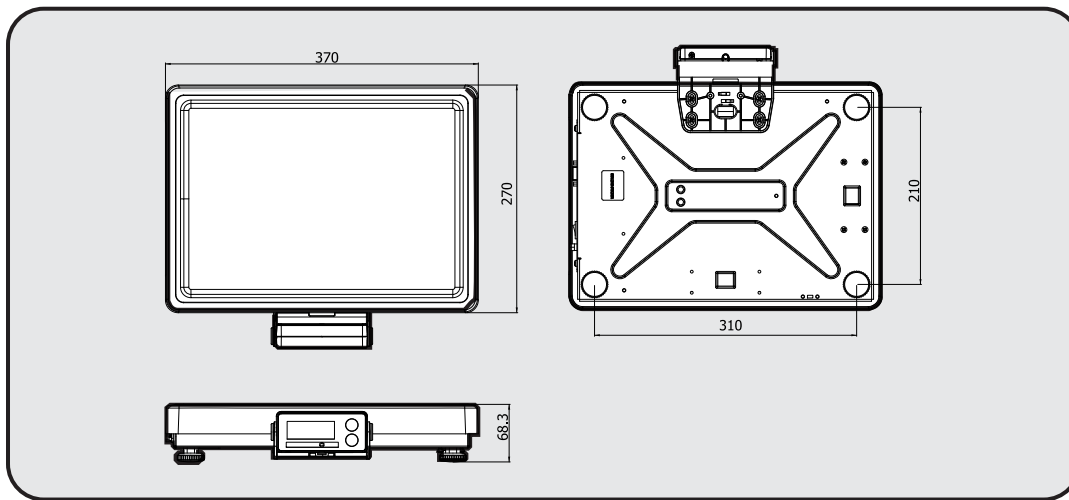
Please keep it handy for the future references.

1.2. Precaution

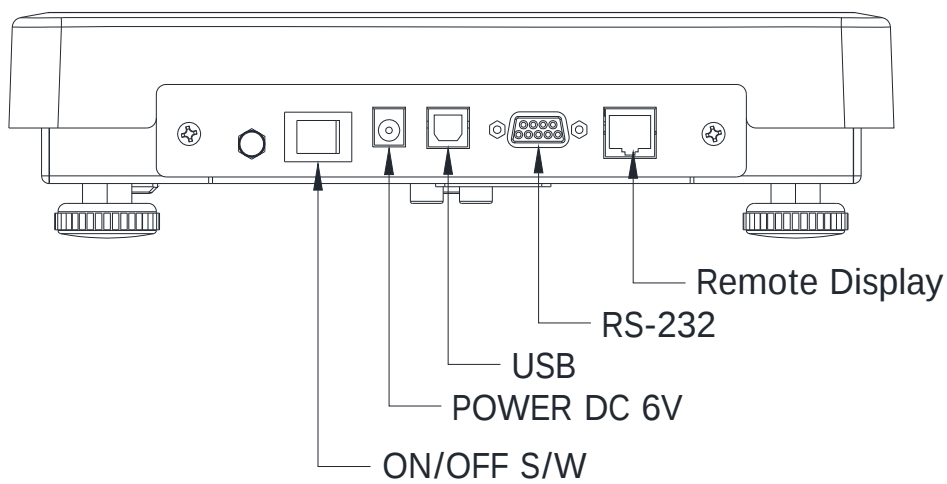
- Make sure that you plug your scale into the proper power outlet.
- Place the scale on a flat and stable surface.
- Plug into a power outlet 30 minutes before operations.
- Keep the scale away from strong EMI noises may cause incorrect weight readings.
- This scale must be installed in a dry and liquid free environment.
- Do not subject the scale to sudden temperature changes.
- Do not subject the platter to sudden shocks.
- If the scale is not properly level, please adjust the 4 legs at the bottom of the scale (turn legs clockwise or counterclockwise) so as to center the bubble of the leveling gauge inside the indicated circle.

2. Classification

2.1. Overall View



◆ I/O PORT



CAS ELECTRICS CO.,LTD

2.2. Specifications

MODEL : PDC

Model	PDC		PDC-S		PDC-D	
Capacity	Dual Interval	Single	Dual Interval	Single	Dual Interval	Single
	Max 3/6kg	Max 6kg	Max 6/15kg	Max 15kg	Max 15/30kg	Max 30kg
e	e=1/2g	e=2g	e=2/5g	e=5g	e=5/10g	e=10g
		e=1g		e=2g		e=5g
		e=0.5g		e=1g		e=2g
		e=0.2g		e=0.5g		e=1g
External Resolution	1/3000	1/3000 ~1/30000	1/3000	1/3000 ~1/30000	1/3000	1/3000 ~1/30000
MAX Tare	-2.999kg -5.998kg -5.998kg -14.995kg -14.995kg -29.990kg					
Display	None		1ea * 57.5 x 24.8 [mm] 6 digit LCD		2ea * 57.5 x 24.8 [mm] 6 digit LCD	
Symbols	ZERO, TARE					
Keys	None		ZERO, TARE			
Dimensions	370 (W) x 270 (D) x 68.3(H)[mm]					
Platter size	370 (W) x 270 (D)[mm]					
Weight	20 kg					
Power	D.C 6V 0.5A Adapter , USB 5V					
Operating Temperature	-10 °C ~ +40 °C / 14 °F ~ 104 °F					
Interface	USB B type, RS-232C					
Option	BLUETOOTH 4.0 , RS-232 CABLE , USB CABLE					

※ Notice: Specifications are subject to change for improvement without notice.

2.3. Display & Key



2.3.1. Key Function

KEYS	FUNCTIONS
	Used to set the zero point.
	Used to input or cancel the weight of tare.

3. Calibration

3.1. Calibration Mode

PDC supports two calibration mode.

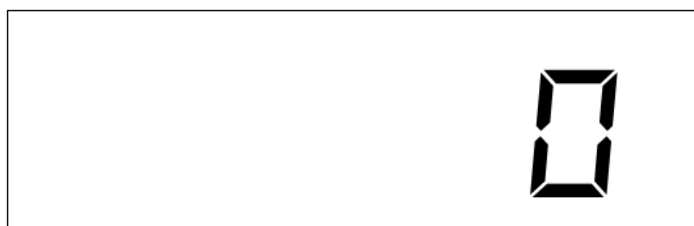
Cal mode 1: 3 – Point Calibration

Cal mode 2: One Point Calibration Mode

3.1.1 Cal mode 1.

(1) Pressing and holding “Calibration Switch” press power on/off switch. It displays “0” message.

For example, for a 3kg scale, when Cal Mode 1 entry, show as follows:



Since it shows the screen as shown below. The meaning of the figure below is shown in Scale setting Table press the [ZERO] key and [TARE] key change the settings, select the desired settings, press the [ZERO] key.



Capacity	Mode	Interval	e	Resolution
3 kg	3000	dual	0.5/1	1/3000
	3001	single	1	1/3000
	3000.5	single	0.5	1/6000
	3000.2	single	0.2	1/15000
	3000.1	single	0.1	1/30000
6 kg	6000	dual	1/2	1/3000
	6002	single	2	1/3000
	6001	single	1	1/6000
	6000.5	single	0.5	1/12000
	6000.2	single	0.2	1/30000
15 kg	15000	dual	2/5	1/3000
	15005	single	5	1/3000
	15002	single	2	1/7500
	15001	single	1	1/15000

CAS ELECTRICS CO.,LTD

	15000.5	single	0.5	1/30000
	30000	dual	5/10	1/3000
	30010	single	10	1/3000
30 kg	30005	single	5	1/6000
	30002	single	2	1/15000
	30001	single	1	1/30000

(2) Press [TARE] to display "C-line".

C-LINE

(3) Press [ZERO] key and then it displays "zero" message.

C-ZERO

(4) Press [M] key and then it displays "On1" message

ON1

(5) Load middle weight (ex:1/3 full capacity) on the platform

(6) Press [M] key and then it displays "On2 " message

ON2

(7) Load middle weight (ex:2/3 full capacity) on the platform

(8) Press [M] key and then it displays "On3 " message

ON3

(9) Load full weight on the platform

CAS ELECTRICS CO.,LTD

A digital display showing the word "PASS" in a large, black, seven-segment font.

(10) Press [ZERO] key and then, the display will show all the segments and count up "9" to "0".

3.1.2. Parameter Setting

After pressing the [ZERO] key and [TARE] key Power ON the display is as follows. Press [ZERO] key Parameter Setting Mode. When press [ZERO] key, digits shift is possible, pressing the [TARE] key to increase the number. After finishing the setting, press the [TARE] key to save, and exit from the menu.

A digital display showing the number "101230" in a large, black, seven-segment font.

Parameter setting, see below table.

DIGIT	Description	Value	Description
DIGIT 6	Initial Zero range	0	Disable (Non OIML)
		1	±10% (OIML)
DIGIT 5		-	
DIGIT 4	Auto Zero Tracking	0~9	0~9 d
DIGIT 3	Zero compensation	0~9	0~9 d
DIGIT 2	Creep compensation	0~9	0~9 d
DIGIT 1		-	

3.2. Cal Mode2

If cal mode 2, it appears as below:

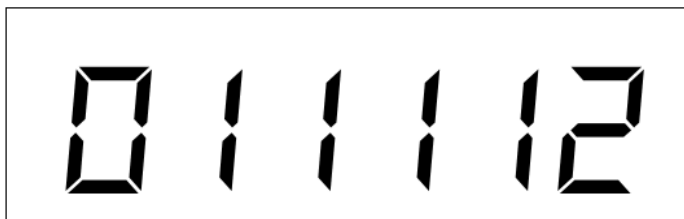
A digital display showing the number "0" in a large, black, seven-segment font.

pressing the [ZERO] key and [TARE] key ,you can only calibrate span calibration.

A digital display showing the word "CAL" in a large, black, sans-serif font.

3.3. Unit Change Settings

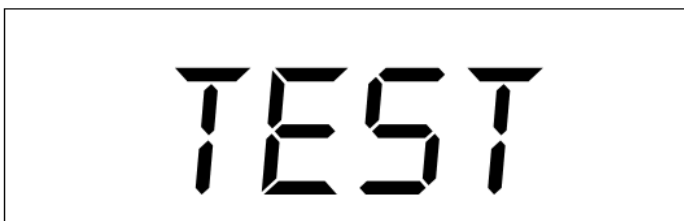
Power On display will show all the segments and count up "9" to "0", press the [TARE] key you can change the user settings. Press [TARE] key, and move digits (digit shift) is possible, pressing the [ZERO] key to increase the number. After finishing the setting, press the [TARE] key to save, and exit from the menu.



DIGIT	Description	Value	Description
DIGIT 6	-	0	
		1	
DIGIT 5	Use kg	0	Don't use
		1	Use
DIGIT 4	Use lb	0	Don't use
		1	Use
DIGIT 3	Use gram	0	Don't use
		1	Use
DIGIT 2	Use oz	0	Don't use
		1	Use
DIGIT 1	Default Weight Unit	0	Use kg
		1	Use lb
		2	Use gram
		3	Use oz

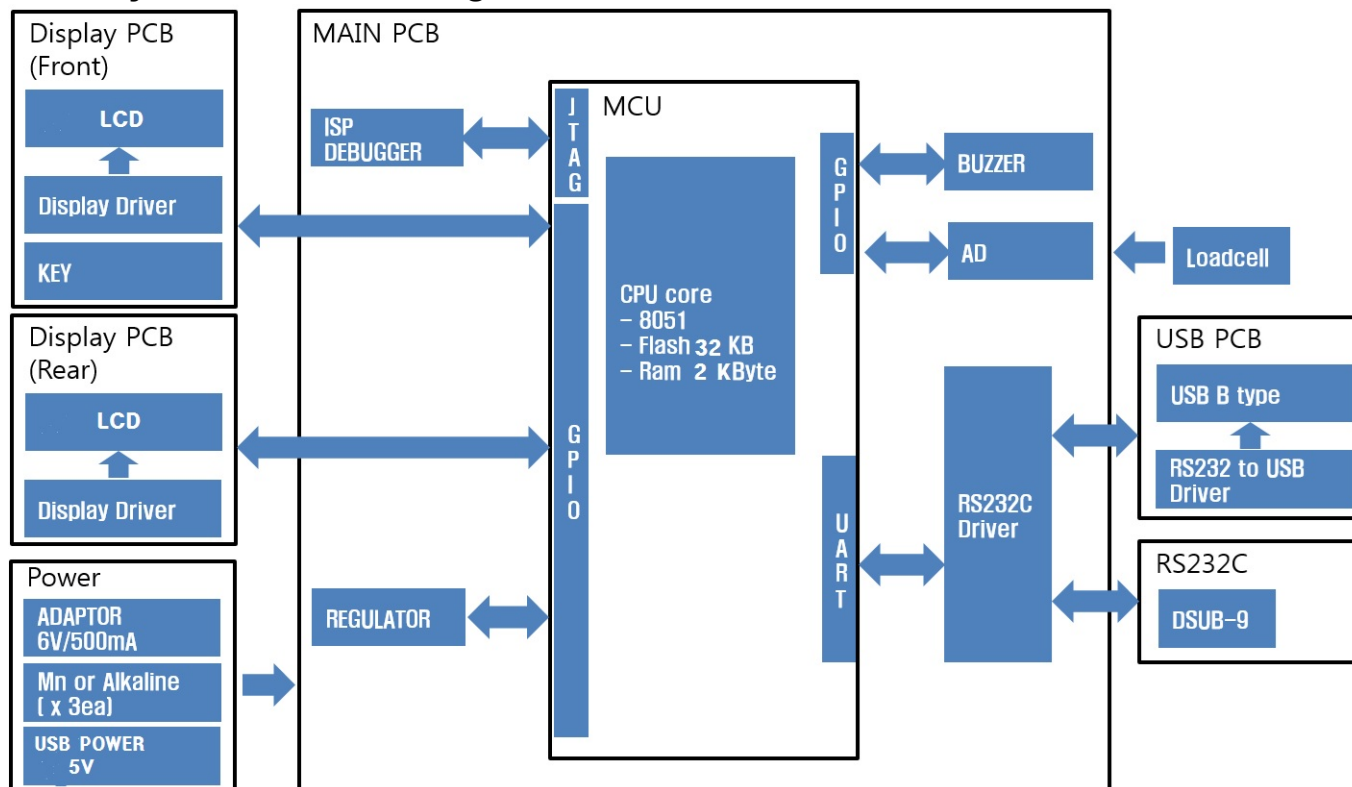
(1) AD test function

If after turning on the power scale, press the [TARE] key , you can check the AD value. In this case, press [ZERO] key to exit to the weighing mode.



4. The Schematics and Diagram

4.1. System Block Diagram



4.2. Circuit Diagram

Please call your CAS dealer.

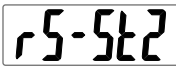
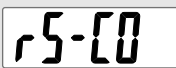
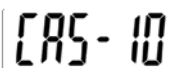
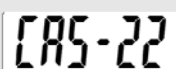
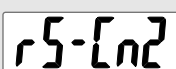
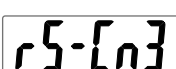
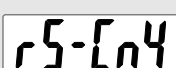
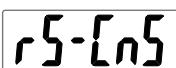
4.3. PC to Scale Communication



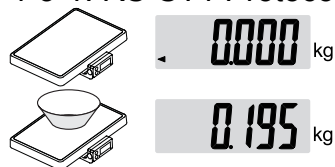
PC Command	PDC Scale
"Z"	Used to set the zero point.
"T"	Used to input or cancel the weight of tare

*Alphabetic capital use

4.3.1. Protocol

	Stable Mode 1 (Transfer data whenever the weight is zero)
	Stable Mode 2 (Transfer data whenever the weight is stable)
	Continue Mode (Continuously transfer data)
	Command Mode (Command transfer Mode : CAS 10 byte)
	Command Mode (Command transfer Mode : CAS 22 byte)
	Continue Mode 1 (Continuously transfer data starting with command 0x0A and 0x0D)
	Continue Mode 2 (Continuously transfer data starting with command 0x0A and 0x0D including decimal point)
	Stable Mode 3 (Continuously transfer data starting with command 0A, 0D whenever weight is stable)
	"P" Command Mode (Command transfer mode starting with command "P")
	"\$" Command Mode (Command transfer mode starting with command "\$")

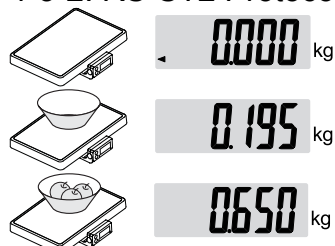
4-3-1. RS-ST1 Protocol



(Transfer data whenever the weight is zero)

0.195k
g [CRLF]

4-3-2. RS-ST2 Protocol



(Transfer data whenever the weight is stable)

0.195kg
[CRLF]
0.650kg
[CRLF]

0.195 kg

PROTOCOL



Start Command : SOH = 01h , STX = 02h
DATA : STA = Stable – 53h , Unstable – 55h
SIGN = 20h (+) , 2Dh (-)
End Command : ETX = 03h , EOT = 04h

		,		,		,	Data (8 bytes)				CR	LF
--	--	---	--	---	--	---	-----------------------	--	--	--	-----------	-----------

- Device ID: 0x0
- Data (8 bytes): When the weight date including a decimal, for example, 13.5 kg, 8 bytes of ASCII code corresponding to '0','0','0','0','1','3','.'and'5' are sent.
- Lamp Status Byte

13

CAS ELECTRICS CO.,LTD

4-3-6. RS-CN1 Protocol(Continue Transmission)

0A	0D	W5	W4	W3	W2	W1	Sp	Sp	P5	P4	P3	P2	P1	Sp	Sp
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

T6	T5	T4	T3	T2	T1
----	----	----	----	----	----

Start Command : 0Ah ,0Dh

Space : Sp – 20h

Data : W5~W1 – Weight , P5 ~P1 – Unit Price , T6~T1 – Total Price

*Decimal Point Not Inclusion

4-3-7. RS-CN2 Protocol (Continue Transmission)

0A	0D	W5	W4	W3	W2	W1	W0	Sp	Sp	P5	P4	P3	P2	P1	P0
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Sp	Sp	T6	T5	T4	T3	T2	T1	T0
----	----	----	----	----	----	----	----	----

Start Command : 0Ah ,0Dh

Space : Sp – 20h

Data : W5~W0 – Weight , P5 ~P0 – Unit Price , T6~T0 – Total Price

* Decimal Point Inclusion

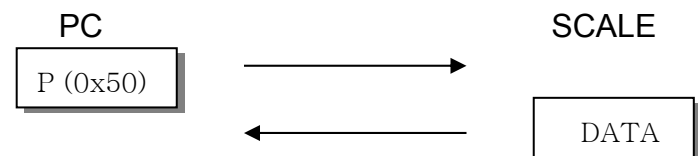
4-3-8. RS-CN3 Protocol (Stable Continue Transmission)

0A	0D	W5	W4	W3	W2	W1	W0
----	----	----	----	----	----	----	----

Start Command : 0Ah ,0Dh

Data : W5~W1 – Weight

4-3-9. RS-CN4 Protocol (Command Mode)

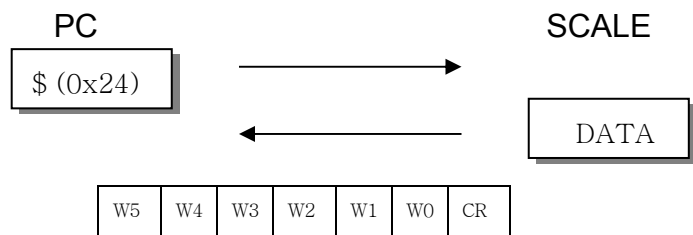


STX	Sp	Sp	W5	W4	W3	W2	W1	W0
-----	----	----	----	----	----	----	----	----

Start Command : STX = 02h

Data : W5~W0 – Weight (Decimal Point Inclusion)

4-3-10. RS-CN5 Protocol (Command Mode)

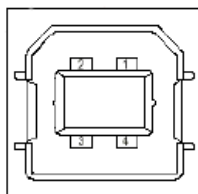


Data : W5~W0 – Weight (Decimal Point Inclusion)

End Command : CR – 0Dh

4.4. USB Interface

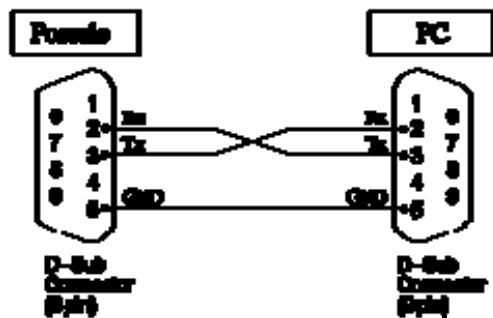
USB Type B Socket



- 1: Vbus (5V)
- 2: D-
- 3: D+
- 4: Ground

RS-232 Interface

Baud Rate : 9600 bps , None Parity , 1 Stop Bit



5. Firmware Update Method

Please call your CAS dealer.



CAS ELECTRICS CO.,LTD

7. Part List

7.1 BODY ASS'Y

NO	Image	Parts Code	Approval	Parts Name	DESCRIPTION	Q'ty
1		1000A0003620	MA-17009	TRAY	TCS 370*270*35*1.0t	1
2		1030A0005540	MA-17010	TOP PLATFORM	TCS 260*200*9*3.0t	1
3		2600A0001050		TRAY RUBBER _C	CL3000 ø20*ø3.2*10.5L	4
4		1030A0005570		L/C PLATE	TA101FA 30.8*30*5t	4
5		1030A0005550	MA-17012	BODY	TCS 300*190*27*2.3t	1
6		1030A0005560	MA-17013	PCB COVER	TCS 180*53*30*0.8t	1
7		2615A000001A		FOOT	SUS M8*25(BW-LOW)(NU	4
8		2022A0000031		WATER LEVEL GAGE ASS"Y	ø18.9*22.8*12(BLACK)상보	1
9		1030A0002030		SEALING PLATE	35.2*26*1t DB-II	1
10		1260A0000150		BOLT-SEALING	M3*8(황동.THA)	2
11		9900A0000010		봉인납	수출용	1
12		9900A0000020		SEALING WIRE	300M/ROLL	1
13				SEALING STICKER		1
14		1501A0003060		SCREW-MACHINE(FH)	M3*6	1
15		9400A0000460		SILICAGEL	10g	1
16		1502A0004060		SCREW-MACHINE(PH)	M4*6	5
17		1502A0003060		SCREW-MACHINE(PH)	M3*6	5
18		1532MSU05300		BOLT-WRENCH(ST)	M5*30-SUS	4
19		2600A0000590		S/W HOLE COVER	NBR. 24*20*7(PW)	2
20		7642A0000020		RETAINER COIL	LC-2 Ø4.2*Ø9*2.6W*50L(CL-D)	3
21		7642S0000030		CABLE CLAMP	DA-3N	1

CAS ELECTRICS CO.,LTD

7.2 INDICATOR ASS'Y

NO	Image	Parts Code	Approval	Parts Name	DESCRIPTION	Q'ty
1		2000A0005770	MA-17014	FRONT CASE	TCS 115*48.7*21.4	2
2		1501A0003060		SCREW-MACHINE(FH)	M3*6	2
3		2000A0005780	MA-17015	INDICATOR BRACKET	TCS 120*42*100.2	1
4		1502A0004080		SCREW-MACHINE(PH)	M4*8(CHINA)	4

7.3 LOADCELL ASS'Y

NO	Image	Parts Code	Approval	Parts Name	DESCRIPTION	Q'ty
1		LLBBCL203G000000		LOADCELL	BCL-20L	1
2		1535MSU06150		BOLT-HEXAGON(WA)	M6*15-SUS	4

7.4 Electronic ASS'Y

NO	Image	Parts Code	Approval	Parts Name	DESCRIPTION	Q'ty
1		6110A0000010		DISPLAY PCB	TCS 100*35	1
2		6100A0000030		MAIN PCB	TCS 140*40	1
		7840W0020800		CONNECTOR WIRE	2P * 80mm (PDC ON/OFF S/W WIRE)	1
		7840W0080270		CONNECTOR WIRE	8P * 270mm (PDC DISPLAY WIRE)	1
3		9505A000025C		DI-POLE ANT(오른나사)	DI-POLE 124mm(ZigBee)	1
4		BB01JP000130		SWITCH	3단 ON/OFF(JP SERIES)	1
6		7562P0602CE0		SMPS ADAPTOR	100-240V/6V0.5A(CE.STRAIGHT)	1

7.5 Design

NO	Image	Parts Code	Approval	Parts Name	DESCRIPTION	Q'ty
1		2050A0063650	MA-17016	DISPLAY COVER_F	TCS 102.8*43.8*0.2t	1
2		2050A0063660	MA-17017	DISPLAY COVER_R	TCS 102.8*43.8*0.2t	1
3		9020-A00-0088		CAPA STICKER (TOOL)	CT100 61.6*5.6	1
4		2050A0063670		PCB COVER STICKER	TCS 180*28*0.2t	1

7.6 CT BOX ASS'Y

NO	Image	Parts Code	Approval	Parts Name	DESCRIPTION	Q'ty
1		9100A0001540	MA-17018	CT BOX	TCS 420*360*140	1
2		9100A0001550		CT PAD	TCS 410*350	1
3		9204A0000190	MA-17019	STYROFOAM	TCS 430*140*110	2
4				Manual	TCS	1
5				POLY BAG		2