

DL-N SERVICE MANUAL

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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 DLN series.

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.

1.3. Specifications

1.3.1. DLN Specifications

	DL – 60N	DL – 100N	DL – 150N	DL – 200N
Capacity / e	60 kg / 0.02 kg 100 lb / 0.05 lb 2,000 oz / 1 oz	100 kg / 0.05 kg 200 lb / 0.1 lb 3,000 oz / 1 oz	150 kg / 0.05 kg 300 lb / 0.1 lb 5,000 oz / 2 oz	200 kg / 0.1 kg 400 lb / 0.2 lb 7,000 oz / 2 oz
Internal Resolution	1 / 30,000	1 / 20,000	1 / 30,000	1 / 20,000
External Resolution	1 / 3,000	1 / 2,000	1 / 3,000	1 / 2,000
Display	5 digits LCD			
Symbols (Indicators)	STABLE, ZERO, TARE, kg, lb, oz, Low Battery			
Keys	ZERO, TARE, HOLD(or MODE) , ON/OFF			
Functions	<ul style="list-style-type: none"> • Simple Weighing function • Hold function(or Hold function, Counting function, Compare function) • Weight Unit Conversion Function (KG/LB/OZ) • Auto Power Off • RS232 Communication 			
Weight	18 kg			
Power	1.5V x 6 (c size battery) or 9 V Adapter			
Op.Temperature	- 10 °C ~ +40 °C			
Options	1.5V x 6 (c size battery)			

1.4. Key

Key	Function
ZERO	To set zero point To do [ZERO] key in the calibration mode.
TARE	To input or cancel the tare (the weight of container).
HOLD	To make the weight of item stable. This weight is average value.
MODE	To change the unit of weight. The unit of weight is shown up in the following sequence, [kg] → [HOLD] -> [WEIGHT LIMIT ON/OFF] → [PCS] → [kg].
ON/OFF	To turn on or off.

1.5. Sealing Method

REVISIONS		2		3							
MODEL NO.	PART NO.	REV	SYM	CONTENTS	DRAWN	CHECKED	APPROVED				
+	A										
+	B										
+	C										
+	D										
NO		PARTS NAME		SPECIFICATION		Q'TY		REMARK			
TOLERANCES UNLESS OTHERWISE SPECIFIED		NAME OR TITLE				CAS					
ANGULAR ± N/A		SEALING METHOD				CAS CORPORATION #19 KANAP-RI KWANGJEOK-MYON YANGJU-KUN KYUNGKI-DO, KOREA					
E	DECIMAL ± N/A		FIRST USED IN ASSEMBLY		BENCH SCALE		MATERIAL		N/A		
+		Q'TY/SET		FIRST MADE FOR		DL		END FINISH		N/A	
+		CONTRACT OR CUSTOMER NO		WORLD WIDE		DO NOT SCALE DRAWING		DIMENSIONS ARE IN $\frac{1}{16}$ INCH			
+		DRAWN		CHECKED		CHECKED		APPROVED		SCALE	
+		.19		.19		.19		.19		F/S	
+		1		2		3		3005-DL0-0000		00	
CAS FORM A4 (210mmx297mm)											

2. Calibration

2.1. General Calibration

Pressing and holding calibration switch press [ON/OFF] key to go to calibration mode.

User can move to other mode by using [ZERO] key in the calibration mode.

User also moves to other sub-modes for each mode by using [MODE/HOLD] and [TARE] key.

Please simply follow below procedure to move to other mode.

(1) Calibration Mode: Pressing and holding "Calibration Switch" press [ON/OFF] key.

It displays "C-0" after "CAL", and it blinks the version of scale three times.

(2) Selecting menu: press [TARE] and then [MODE/HOLD].

(3) ENTER(Setting) : [ZERO] key

MODE	Function
C - 0	To go back to simple weighing mode
C - 1	To display internal value of weight To calibrate the span value To calibrate the linearity
C - 2	-
C - 3	Weight Setting Mode ("UnLoad" → [ZERO] → "Load" → [ZERO] after loading → "END" on display)
C - 4	<u>Capacity displayed and Option Setting</u>
C - 5	Net internal value of weight (zero value confirmed)
C - 6	To check the mid-calibration point value.
C - 7	Percent Weight Setting Mode
C - 8	-
C - 9	Gravity constant

< Modes >

2.1.1.C4 Setting

2.1.1.1. C4-1 Setting

B7	B6	B5	B4	B3	B2	B1	B0
-	Calibration Unit	-		Display Unit		TARE	
-	0 : kg 1 : lb	-		00 : kg 01 : lb 10 : oz		00:(+)One-time (-)One-time 01:(+)Successive (-)One-time 10:(+)One-time (-))Successive 11:(+)Successive(-)successive	

User should input Hexa code to set C4.

User should input "calibration unit", "display unit", and "tare".

For example, if you want to set "kg (0)" as the weight unit, or "(0)" as TARE you may input "00" as Hexa value.

2.1.1.2. C4-2 Setting

B7	B6	B5	B4	B3	B2	B1	B0
CAPACITY					-	-	
		Kg	lb	oz			
01100		60	100	2,000			
10000		100	200	3,000			
01101		150	300	5,000			
01110		200	300	7,000			

DLN Series has four different weight units, kg, lb, or oz as shown in shaded area. You can set the capacity to input first 5 bits, for example, "01100" for 60 kg capacity.

For example, if you set 60 kg interval the Hexa value will be "0x60".

2.1.1.3. C4-3 Setting

B7	B6	B5	B4	B3	B2	B1	B0
-	-	-	-	-	-	Funciton	

							00 :Hold Function 02 :Count Function 03 :Hold + Count Function
--	--	--	--	--	--	--	---

C4-3 is to set to use the hold function or the count function or the hold and count function..

2.1.1.4. C4-4 Setting

B7	B6	B5	B4	B3	B2	B1	B0
Unit change	-	-	Displaying unit	-	-		
0 : no use 1 : use			0 : dp 1 : comma				

C4-4 is to set to use the unit change function and the displaying unit and the zero tracking.

2.1.1.5. C4-5 Setting

B7	B6	B5	B4	B3	B2	B1	B0
RS232	-	-	-	-	-	-	-
0 : OFF 1 : ON							

2.1.1.6. C4-6 Setting

B7	B6	B5	B4	B3	B2	B1	B0
-	-	-	-	-	-	Init Zero	
						00 :10% 01 : 2% 10 : 15% 11 : 20%	

2.1.2. SPAN Calibration Setting (C-3)

(1) Pressing and holding "Calibration Switch" press [ON/OFF] key.

After "CAL" message blinks three times and shows the version of scale, it displays "C-0" message.

(2) Press [TARE] to display "C-3".

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

(4) Press [ZERO] key if you want to scroll it.

※ To exit from SPAN Calibration mode press [TARE] key when "UnLOAD" or "LOAD" message is displayed.

2.1.3. Percent SPAN Calibration Setting (C-7)

(1) Pressing and holding "Calibration Switch" press [ON/OFF] key.

After "CAL" message blinks three times and shows the version of scale, it displays "C-0" message.

(2) Press [TARE] to display "C-7".

(3) Press [ZERO] key and then it displays "PE 10" message. Select the percent value using the [HOLD] key.

(4) Press [ZERO] key and then it displays "UnLOAD" message.

(5) Press [ZERO] key if you want to scroll it.

※ To exit from Percent SPAN Calibration mode press [TARE] key when "PE 10" or "UnLOAD" or "LOAD" message is displayed.

2.1.4. Gravity Constant Value Setting (C-9)

Current gravitational Acceleration value is set to 9.7996 m/s^2 .

(1) Pressing and holding "Calibration Switch" press [ON/OFF] key.

After "CAL" message blinks three times and shows the version of scale, it displays "C-0" message.

(2) Press [TARE] to display "C-9".

(3) Press [ZERO] key, and then "G-1" message and "9.7996" will be shown. The first digit, "9" will blink.

(4) Input a gravitational acceleration value by using [MODE/HOLD] and [TARE] key.

(5) Press [ZERO] key, and then "G-2" message blinks. "9.7996" will be shown. The first digit, "9" will blink.

(6) Input a gravitational acceleration value by using [MODE/HOLD] and [TARE] key.

(7) Press [ZERO] key to save the gravitational acceleration value, and "C9 END" message will be shown shortly.

2.1.5. Displaying Real A/D Value (C-5)

- (1) Under Calibration switch on press [ON/OFF] key.

After "CAL" message blinks three times and the version of scale is displayed, "C-0" message will be displayed.

- (2) Press [TARE] to display "C-5".
- (3) Press [ZERO] key, and then the display will show a real A/D value.
- (4) Press [ZERO] key to exit from it.

2.1.6. How to confirm SPAN calibrated A/D value (C-1)

2.1.6.1. To calibrate the span value

- (1) Pressing and holding Calibration Switch please press [ON/OFF] key.

After "CAL" message blinks three times and the version of scale is displayed, "C-0" message will be displayed.

- (2) Press [TARE] to change "C-0" to "C-1".
- (3) Press [ZERO] key, and then it displays SPAN calibrated A/D value, "0".
- (4) When the weighing value of maximum capacity is not stable you may use [TARE] key to decrease or [MODE] key to increase the value.

For example, when you weigh maximum capacity on the platter in case of 1/20,000 it may display "19,999" or "20,001". You can adjust up or down to "20,000" using [MODE] or [TARE] key.

- (5) Press [ZERO] to go to and display "C - 1" and you may scroll it at this point. Then, if you press [ZERO] key again it automatically saves "Span Factor" on it.

2.1.6.2. To calibrate the linearity

- (1) Pressing and holding Calibration Switch please press [ON/OFF] key.

After "CAL" message blinks three times and the version of scale is displayed, "C-0" message will be displayed.

- (2) Press [TARE] to change "C-0" to "C-1".
- (3) Press [ZERO] key, and then it displays SPAN calibrated A/D value, "0".
- (4) When the weighing value is not stable you may use [TARE] key to decrease or [MODE] key to increase the value.

For example, when you weigh half capacity on the platter in case of 1/20,000 it may display "9,999" or "10,001". You can adjust up or down to "10,000" using [MODE] or [TARE] key.

2.1.7. To delete the linearity calibration value.

- (1) Pressing and holding Calibration Switch please press [ON/OFF] key.

After "CAL" message blinks three times and the version of scale is displayed, "C-0" message will be displayed.

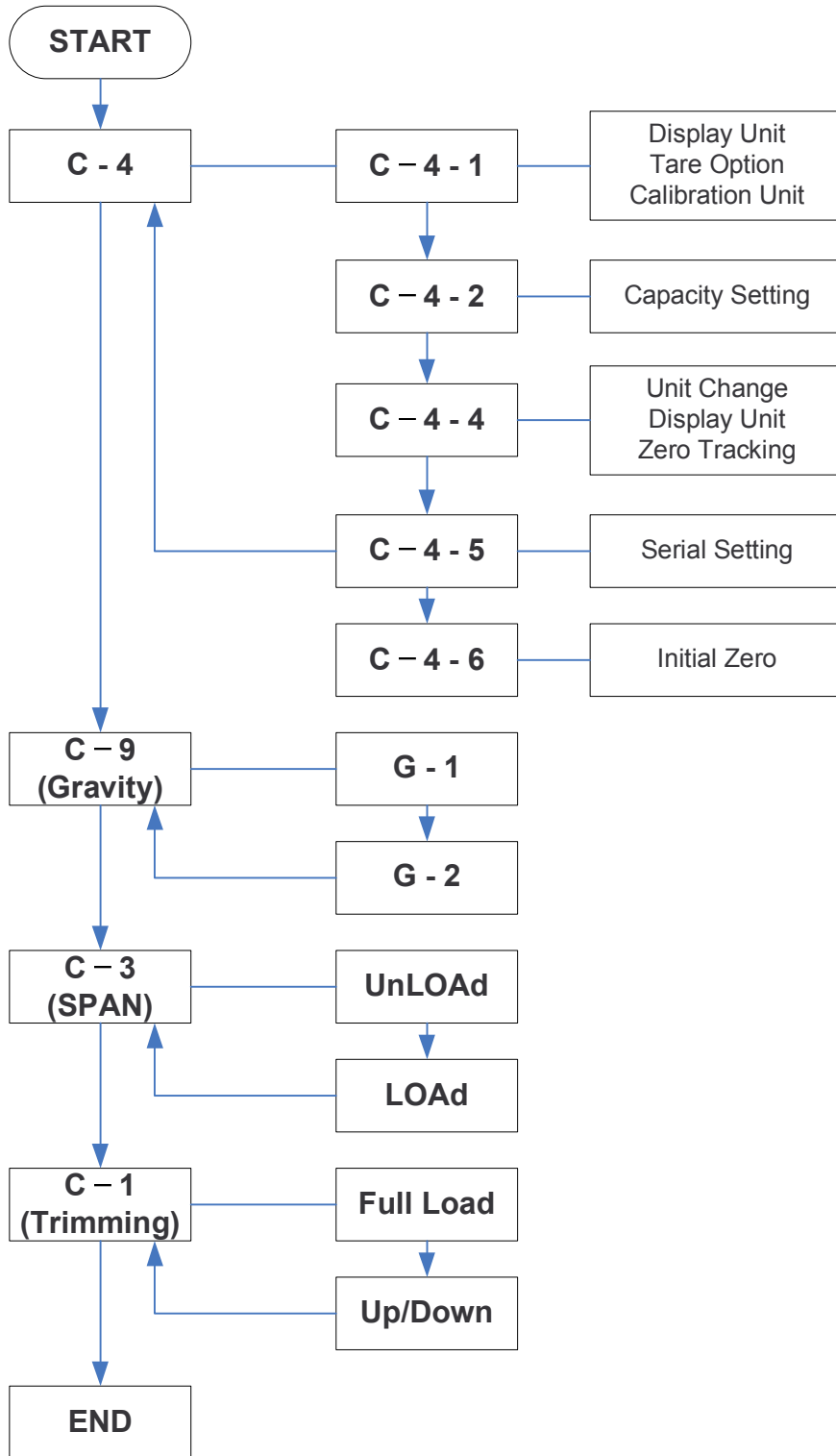
- (2) Press [TARE] to change "C-0" to "C-6".
- (3) Press [ZERO] key.
- (4) It displays "POS-1". And then displays the position value of the linearity calibration.
- (5) And it displays "NUM-1" and then displays the linearity calibration value.
- (6) To delete the position value and the linearity calibration value, pressing and holding the [MODE or HOLD] key press the [TARE] key.

※ To exit from the mode to delete the linearity calibration value press [TARE] key.

2.1.8. Back to the normal weighing mode (C-0)

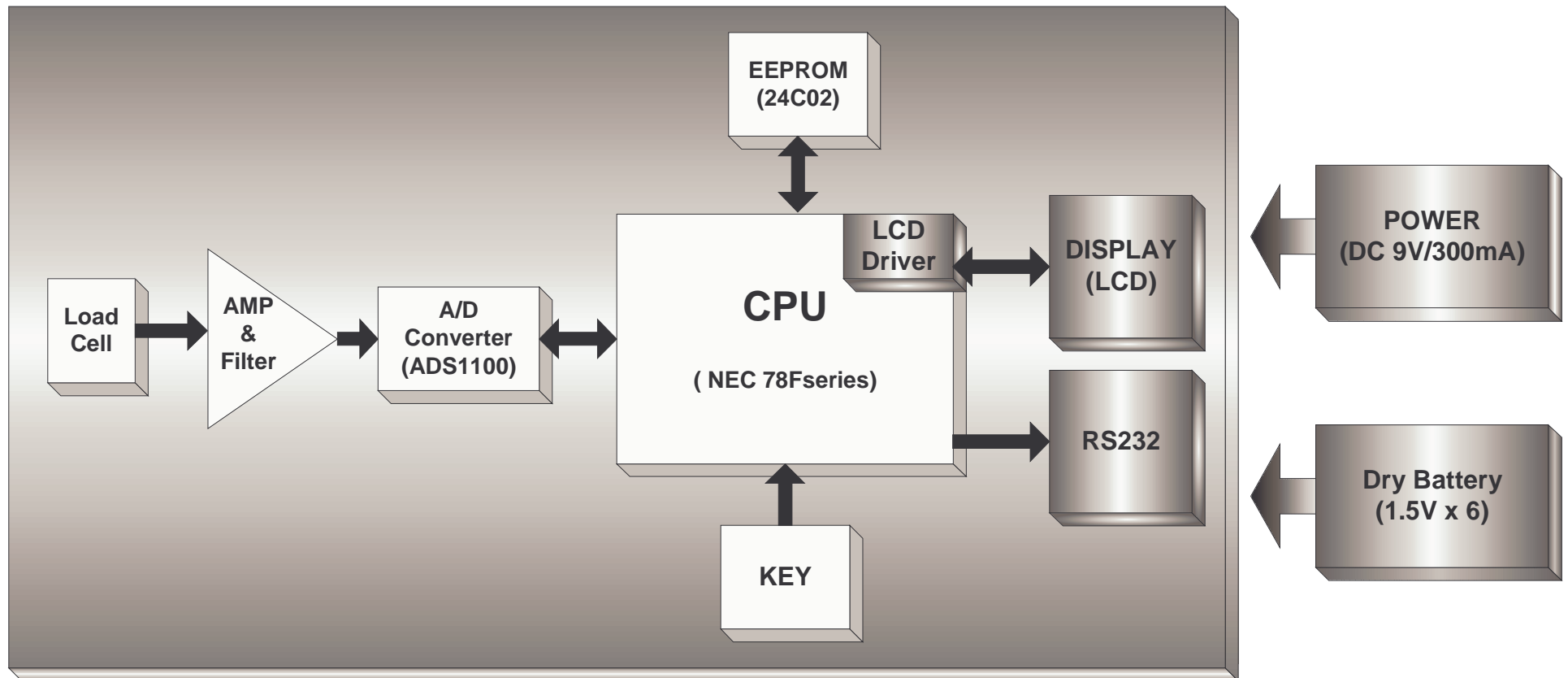
- (1) Under the Calibration Switch ON press [ON/OFF] key.
After "CAL" message blinks three times and the version of scale is displayed, "C-0" message will be displayed.
- (2) You may exit from Calibration mode by pressing [ZERO] key.

2.1.9. Calibration Block Diagram



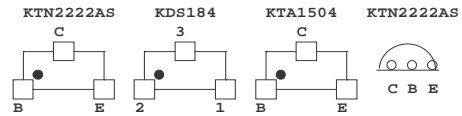
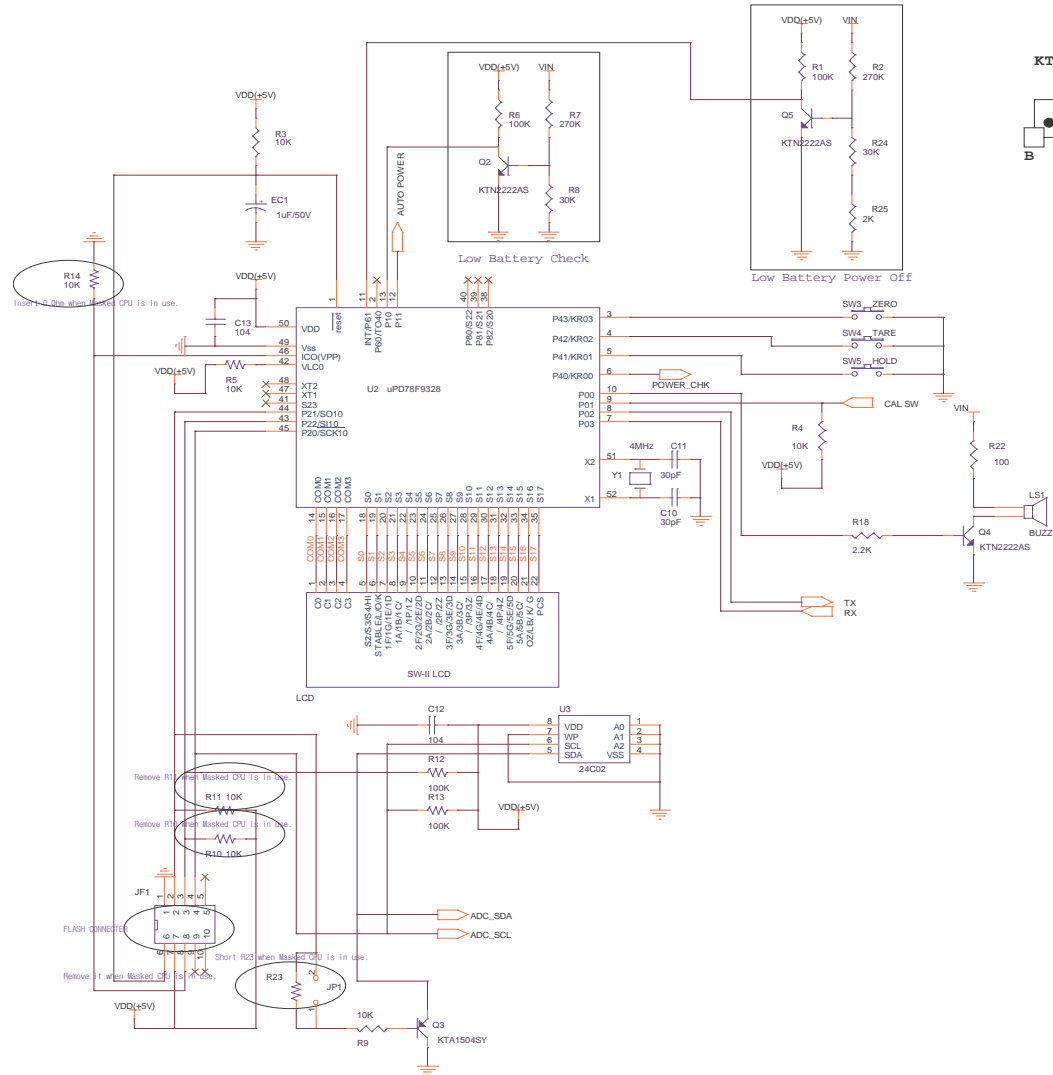
3. The Schematics and Diagram

3.1. System Block Diagram



3.2. Circuit Diagram

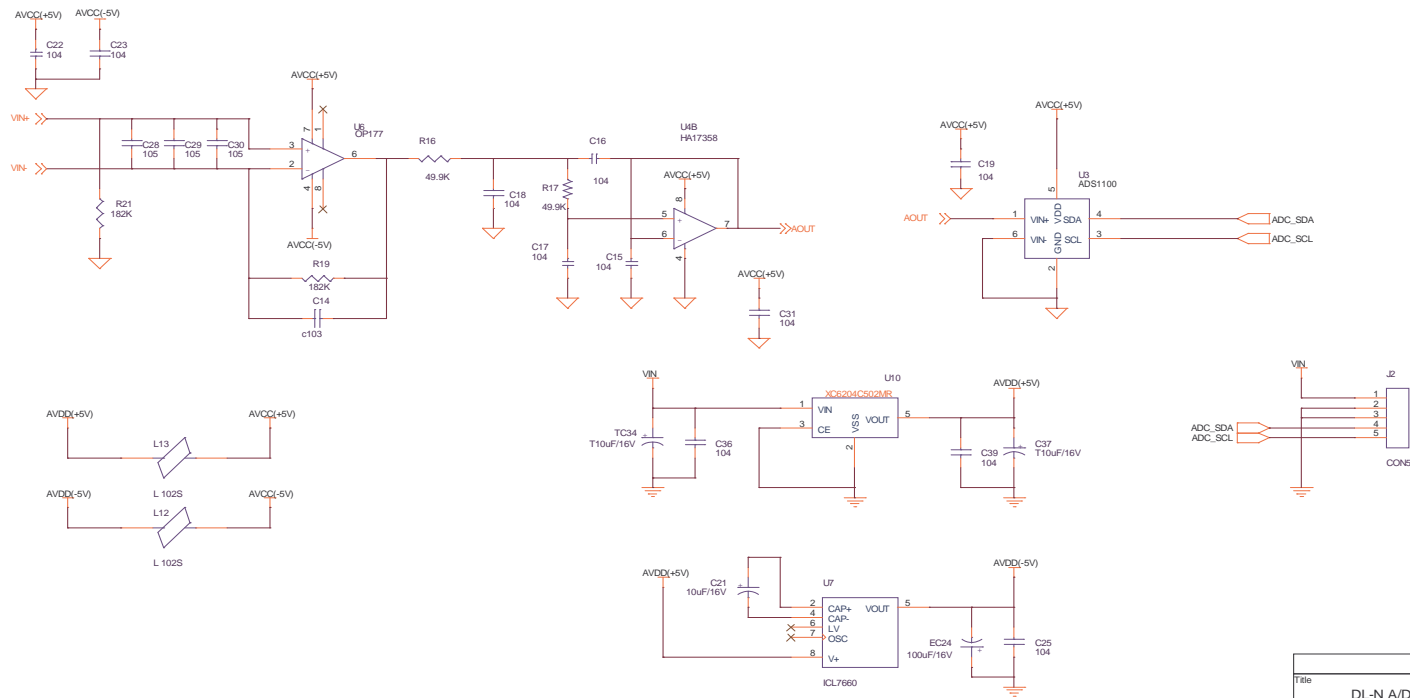
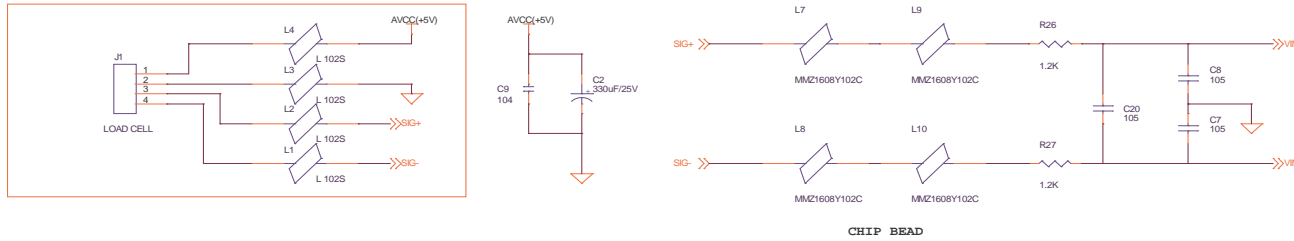
3.2.1. Main



Part NO.	FLASH TYPE	MASKED TYPE
R10, 11	10K	REMOVE
R14	10K	Insert 0 ohm or short
R23	NO USE	Insert 0 ohm or short
Flash connector	Insert	REMOVE
JP1	Insert	REMOVE

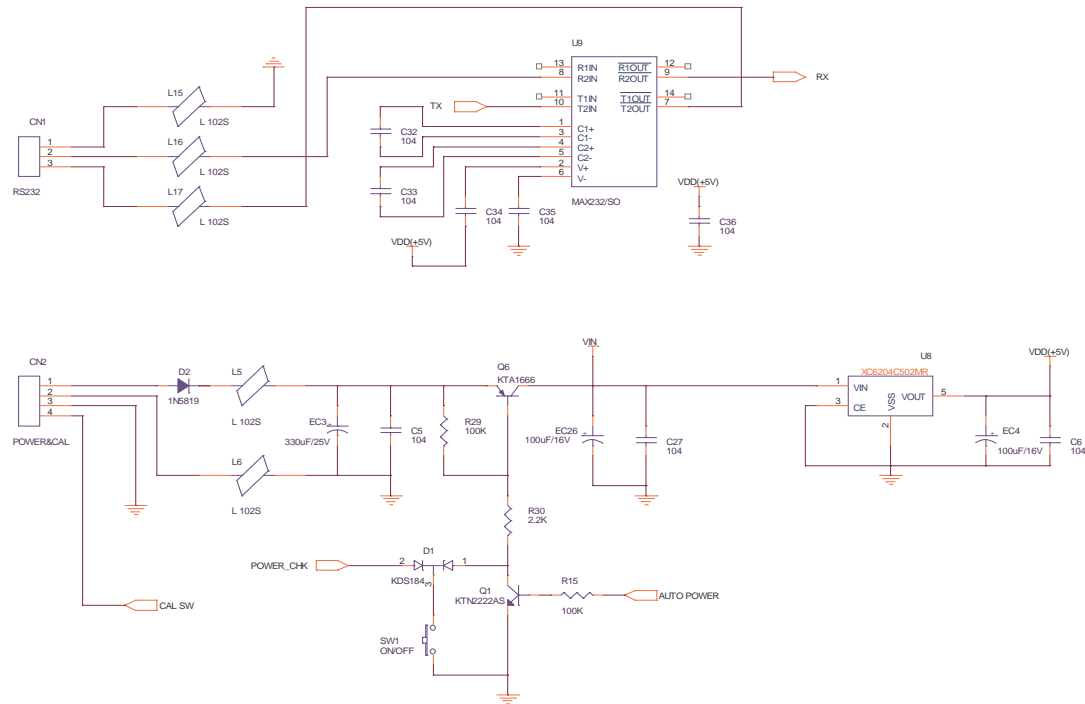
Title		
DL-N MAIN CIRCUIT DIAGRAM		
Size	Document Number	Rev
A3	6100-PDL-0000-0	1.0
Date	Tuesday, May 31, 2006	Sheet 2 of 3

3.2.2.A/D



Title		
DL-N A/D CIRCUIT DIAGRAM		
Size	Document Number	Rev
A3	6100-PDL-0000-0	1.0
Date:	Tuesday, May 31, 2005	Sheet 1 of 3

3.2.3. POWER

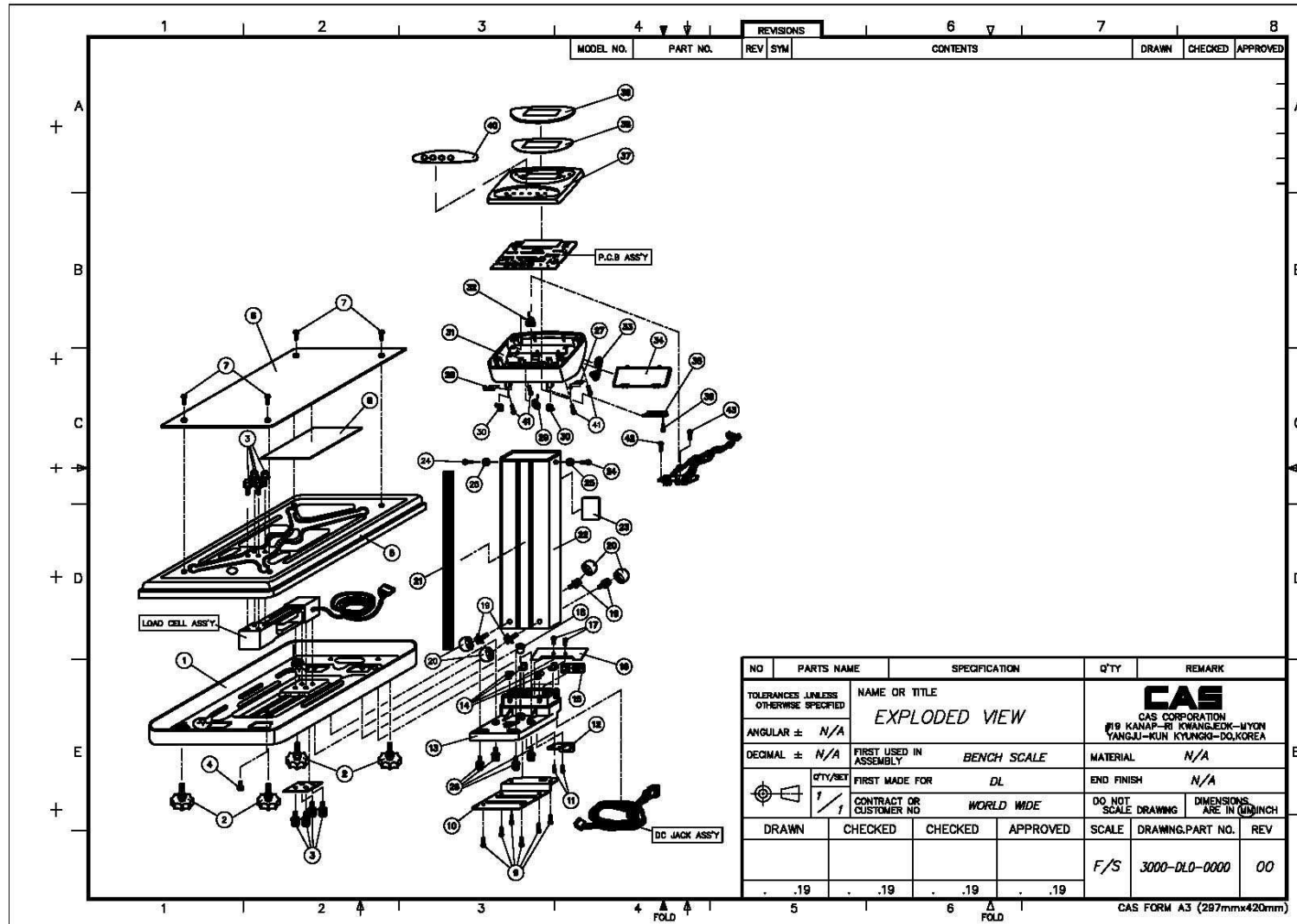


Title		
DL-N POWER CIRCUIT DIAGRAM		
Size	Document Number	Rev
A3	6100-PDL-0000-0	1.1
Date:	1/25/2005	Sheet 3 of 3

3.2.4. CALIBRATION

- 2.1.9. Calibration Block Diagram 참조

4. Exploded View

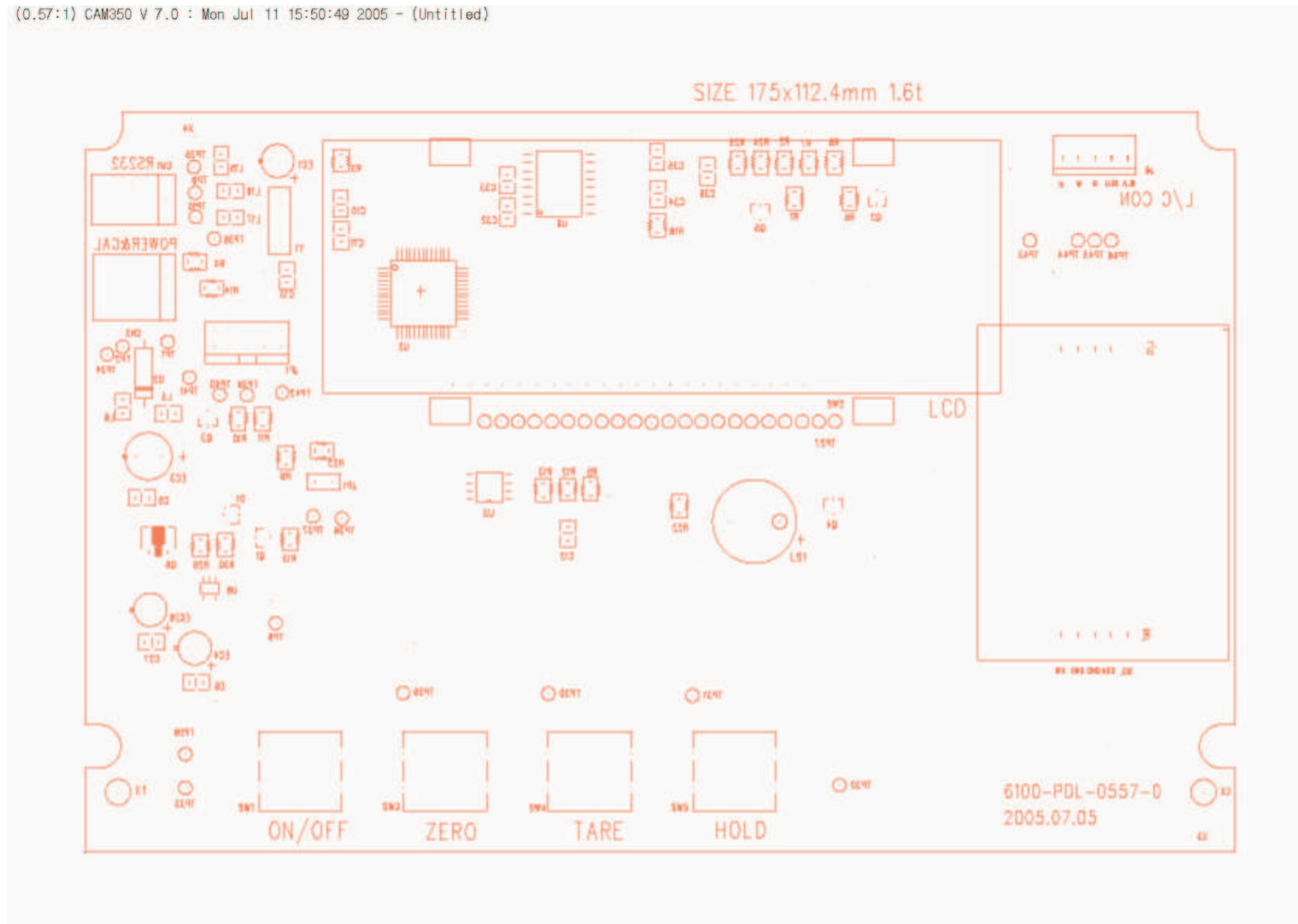


NO	PARTS NAME	SPECIFICATION	Q'TY	REMARK
TOLERANCES UNLESS OTHERWISE SPECIFIED		NAME OR TITLE		 CAS CORPORATION #19 KANAP-RI KWANGJUK-AYON YANGJU-KUN KYUNGKI-DO, KOREA
ANGULAR ± N/A		EXPLODED VIEW		
DECIMAL ± N/A		FIRST USED IN ASSEMBLY	BENCH SCALE	MATERIAL N/A
Q'TY/SET		FIRST MADE FOR	DL	END FINISH N/A
DRAWN		CONTRACT OR CUSTOMER NO	WORLD WIDE	DO NOT SCALE DRAWING DIMENSIONS ARE IN () INCH
CHECKED	CHECKED	APPROVED	SCALE	DRAWING PART NO. REV
			F/S	3000-DLD-0000 00

5. Part Location

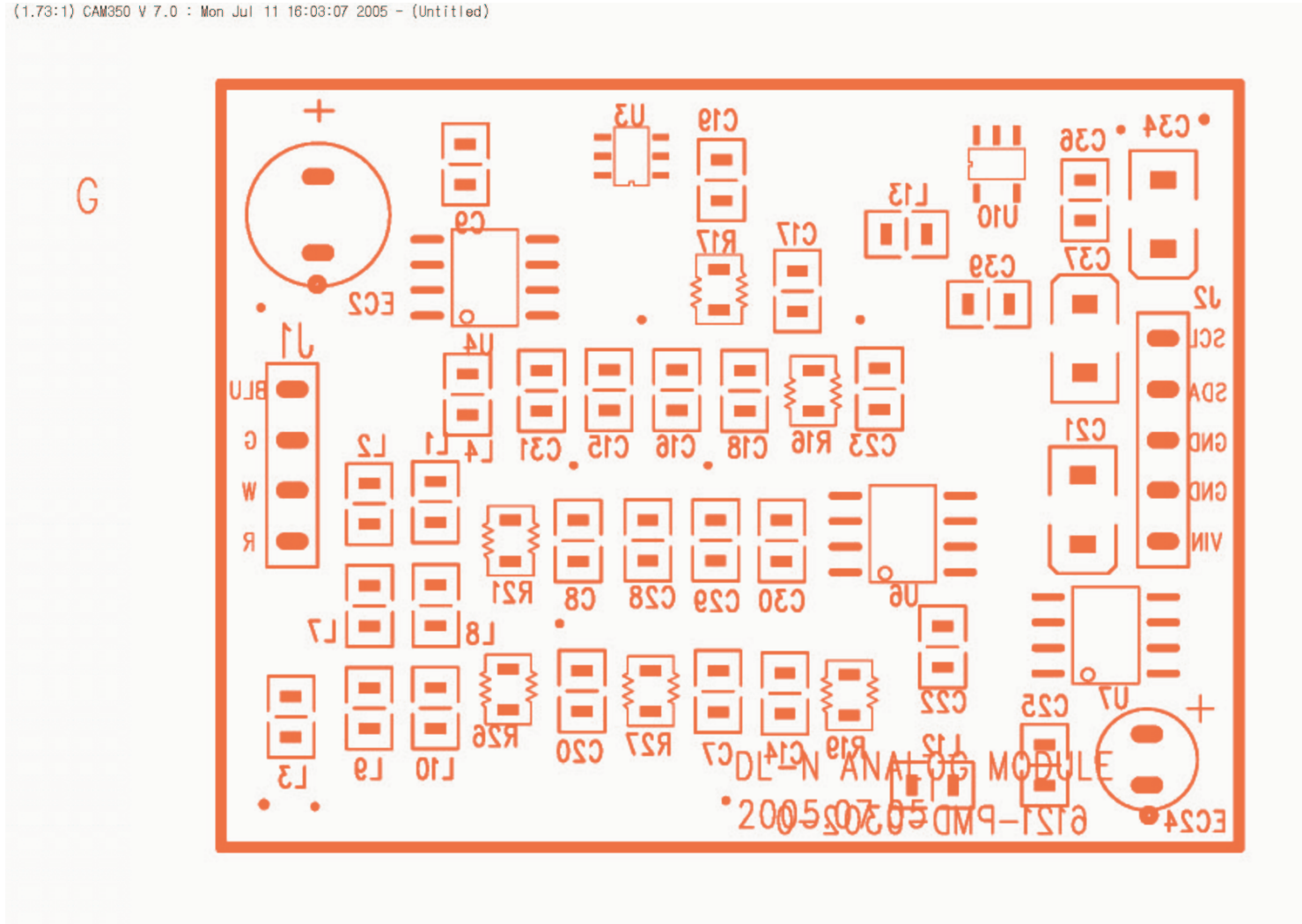
5.1. Main PCB

(0.57:1) CAM350 V 7.0 : Mon Jul 11 15:50:49 2005 - (Untitled)



5.2. ANALOG PCB

(1.73:1) CAM350 V 7.0 : Mon Jul 11 16:03:07 2005 - (Untitled)



6. Error Messages & Solution

6.1. Beep: Re-zero

The range of "Re-zero" is within $\pm 2\%$ of full capacity. However, when the scale is out of this range it automatically beeps to notify to user that "Re-zero" function does not work in this range.

6.2. Err: Initial Zero

You may set 2% or 10% of full capacity as Initial Zero.

When you place an item more than the initial zero setting value (2% or 10% of full capacity) and turn on the scale it display "Err" message and does not work.

However, you can make the scale work if you make the item's weight be within the initial zero setting range (2% or 10% of full capacity) by decreasing the value of weight.

6.3. Init: Failure of Analog Module

"Init" message shows up when there is some problem on analog module.

Please turn off the scale and turn on. If you still have "Init" message on display please contact CAS A/S service.

6.4. UNSTA: A/D Value Unstable

The scale displays "UNSTA" when it is in unstable status or in low-power supply.

If the scale is not properly balanced, 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. And if the scale is in low power supply please replace the battery or plug in adapter.

However, if you still have "UNSTA" problem please contact CAS A/S service.