DIGI®
When Accuracy Counts

DC-1 90

Counting Scale

Operation Manual

RICE LAKE WEIGHING SYSTEMS
Industrial Solutions on a Global Scale®

ISO 9001 REGISTERED

73352

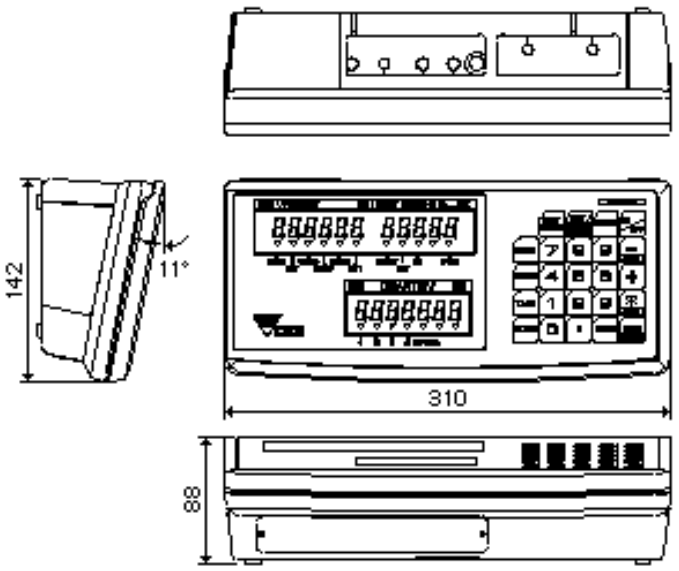
CONTENT

1 GENERAL SPECIFICATION

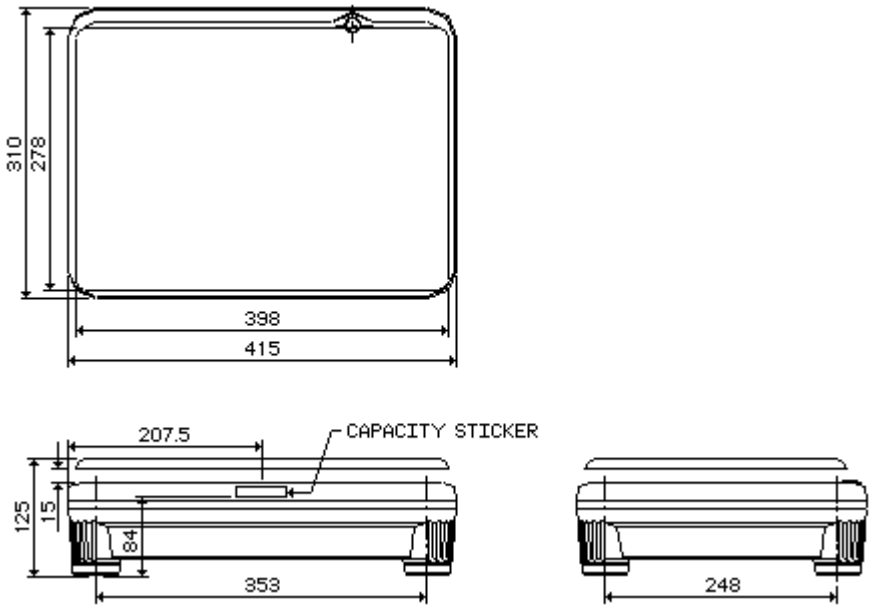
Model	:	DI 190 (Indicator) DC 190 (Pole / Bench)
Dimension	:	Indicator - 142 (L) X 310 (W) X 88 (H) Pole - 415 (L) X 420 (W) X 455 (H) Bench - 415 (L) X 435 (W) X 120 (H)
Capacity	:	Single Loadcell (Pole / Bench - SX Platform) 500g, 1 Kg, 2.5 Kg, 5 Kg, 10 Kg, 25 Kg, 50 Kg 1Lb, 2.5 Lb, 5 Lb, 10 Lb, 25 Lb, 50 Lb, 100 Lb Dual Loadcell (Pole / Bench- SX Platform) 500g & 2.5 Kg, 500g & 5 Kg, 1 Kg & 5 Kg, 1kg & 10 Kg
Number Of Loadcells	:	2 Internal, 1 External, 1 Force Balance (RS232C)
Loadcell Connectivity	:	0.4 ~ 2.46 mV/V
Type Of Display	:	VFD Weight Display - 6 Digits Unit Weight Display - 5 Digits Quantity - 7 Digits
Display Resolution	:	1 / 10,000 ; 1 / 5,000 ; 1 / 2,500
Counting Resolution	:	1 / 500,000 ; 1 / 1,000,000
Keyboard	:	Mechanical key switch
Printing Items	:	Time; ID code; Lot No; Net Weight; Gross Weight; Unit Weight; Tare Weight; Parts Name; Parts No; Quantity
Memory Item	:	200 items
Set Point Output	:	6 Set Points (Open Collector type)
Option	:	RS232C - PC; Barcode Scanner (TTL or RS232C type); Printer SE 250, LP 2622 and LP2722; Force Balance (Ohaus Explorer)
Power Source	:	DI 190 - AC/DC Adapter Only DC 190 - AC/DC Adapter, Rechargeable Battery or AC power. i) AC/ DC 12 V / 1.4A Adapter (Class II Type) ii) Rechargeable Battery - Panasonic LC-R123R4PTI (AC voltage to charge; must charge > 6 hrs; usage approx. 7 hrs.) iii) AC 115 / 220 V

2 OVERALL DIMENSION

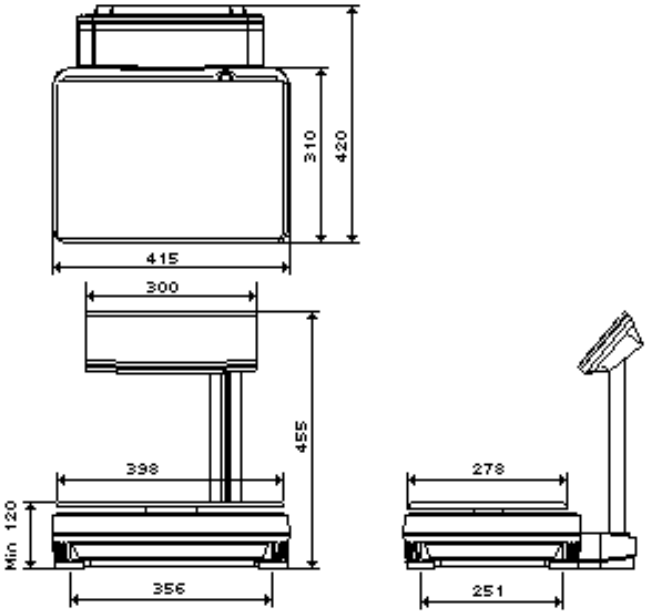
2.1 DC 190 INDICATOR



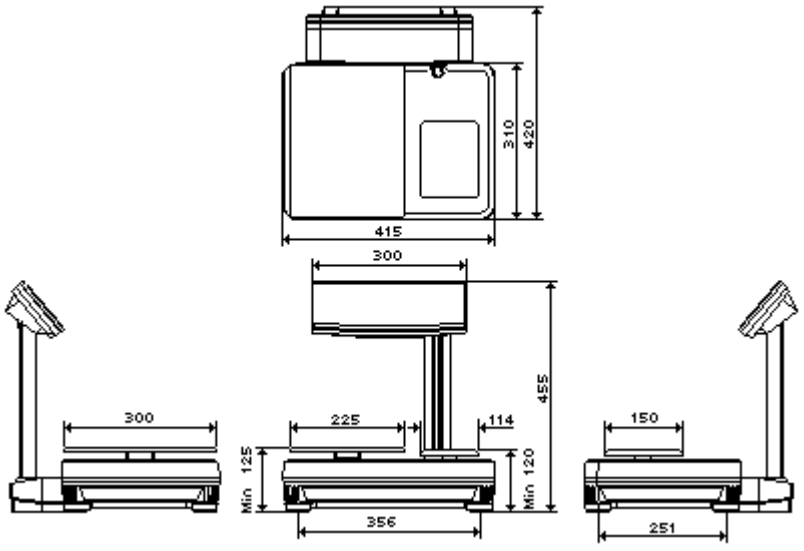
2.2 S-X PLATFORM



2.3 POLE TYPE

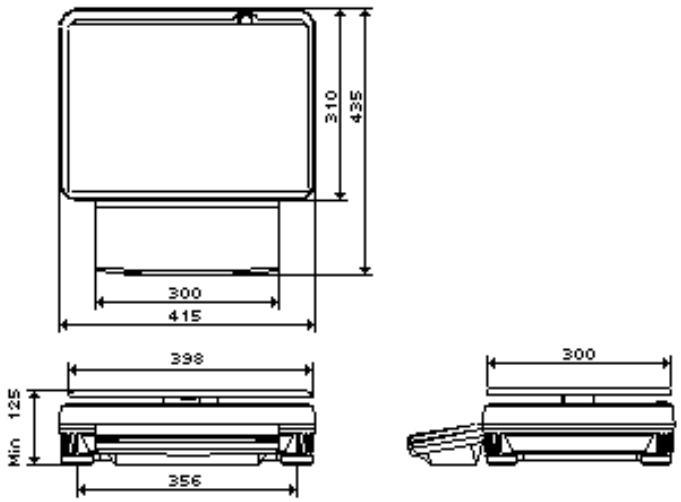


POLE TYPE WITH 1 SCALE

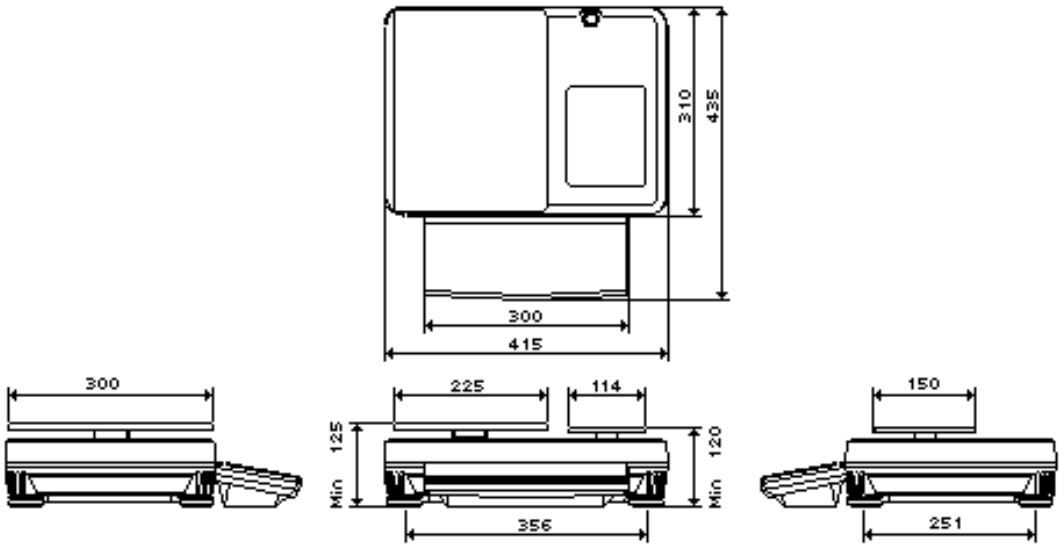


POLE TYPE WITH 2 SCALES

2.4 BENCH TYPE

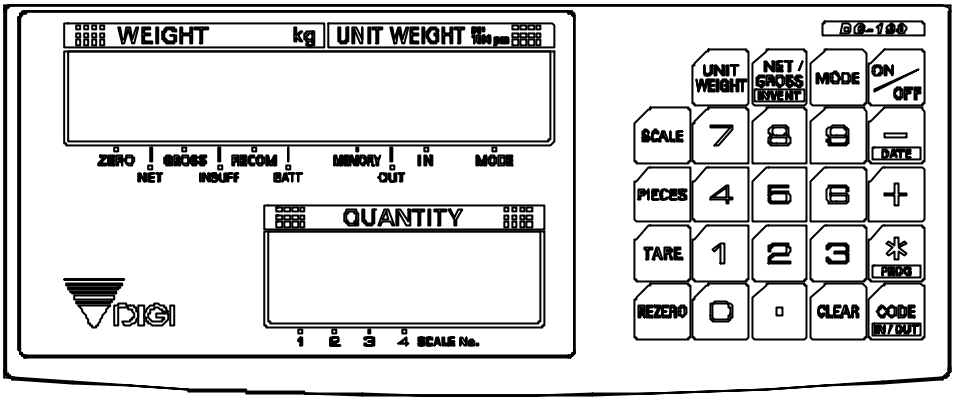


BENCH TYPE WITH 1 SCALE



BENCH TYPE WITH 2 SCALES

3 KEYSHEET AND DISPLAY LAYOUT



KEY FUNCTION

ON/OFF ——— Turn on and off the machine.

MODE ——— Change the maintenance and weighing mode

REZERO ——— To reset the zero point of the scale.

CLEAR ——— To clear the data of entries and unit weight.

TARE ——— To set and clear the tare weight

PIECES ——— To compute unit weight by sampling

SCALE ——— To switch between different scales

UNIT WEIGHT ——— To enter unit weight using numeric key board

+ ——— To accumulate; to increase SPEC no; to program set point

− DATE ——— To subtract; to decrease SPEC no; to program parts no., date and time

PROG ——— To print data when printer is connected; store SPEC data

CODE IN/OUT ——— To callout PLU data; to program commodity name in programming mode

NET/GROSS INVENT ——— To change between Gross and Net; use as inventory key

0 — 9 ——— Numeric No.

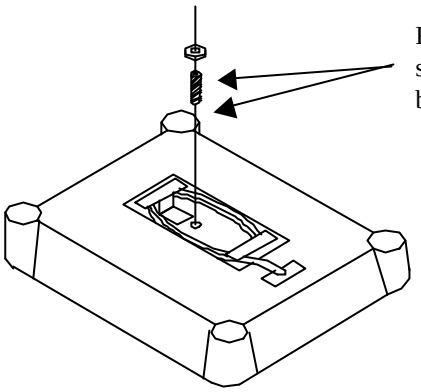
. ——— Decimal Point

INDICATOR LAMPS

ZERO	———	When the gross weight is zero
NET	———	When tare weight is set
GROSS	———	When [Gross/Net] is pressed
INSUFF	———	When net weight is below a specific percentage of capacity weight
RECOM	———	When unit weight re-computing is possible
MEMORY	———	When quantity is being accumulated or when memory overflows
MODE	———	When in the programming mode
BATT	———	When battery power level is low
SCALE 1	———	When built in platform 1 is used
SCALE 2	———	When built in platform 2 is used
SCALE 3	———	When external platform is used
SCALE 4	———	When force balance is used
IN	———	Inventory in
OUT	———	Inventory out

4 INITIAL SETUP

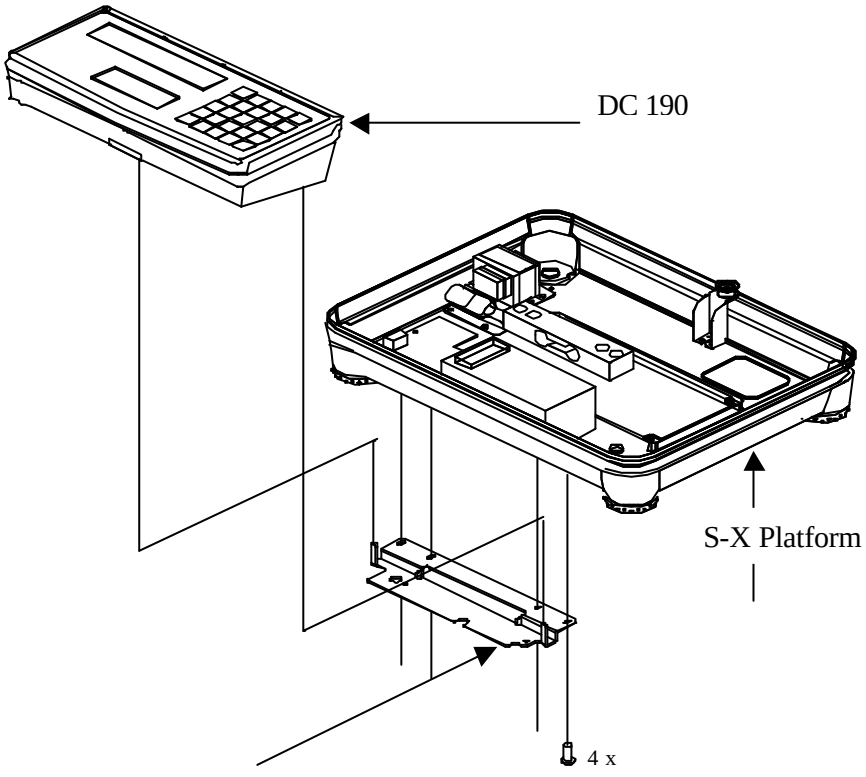
4.1 SET UP



BOTTOM OF S-X PLATFORM

4.1.1 DC 190 BENCH TYPE SET UP

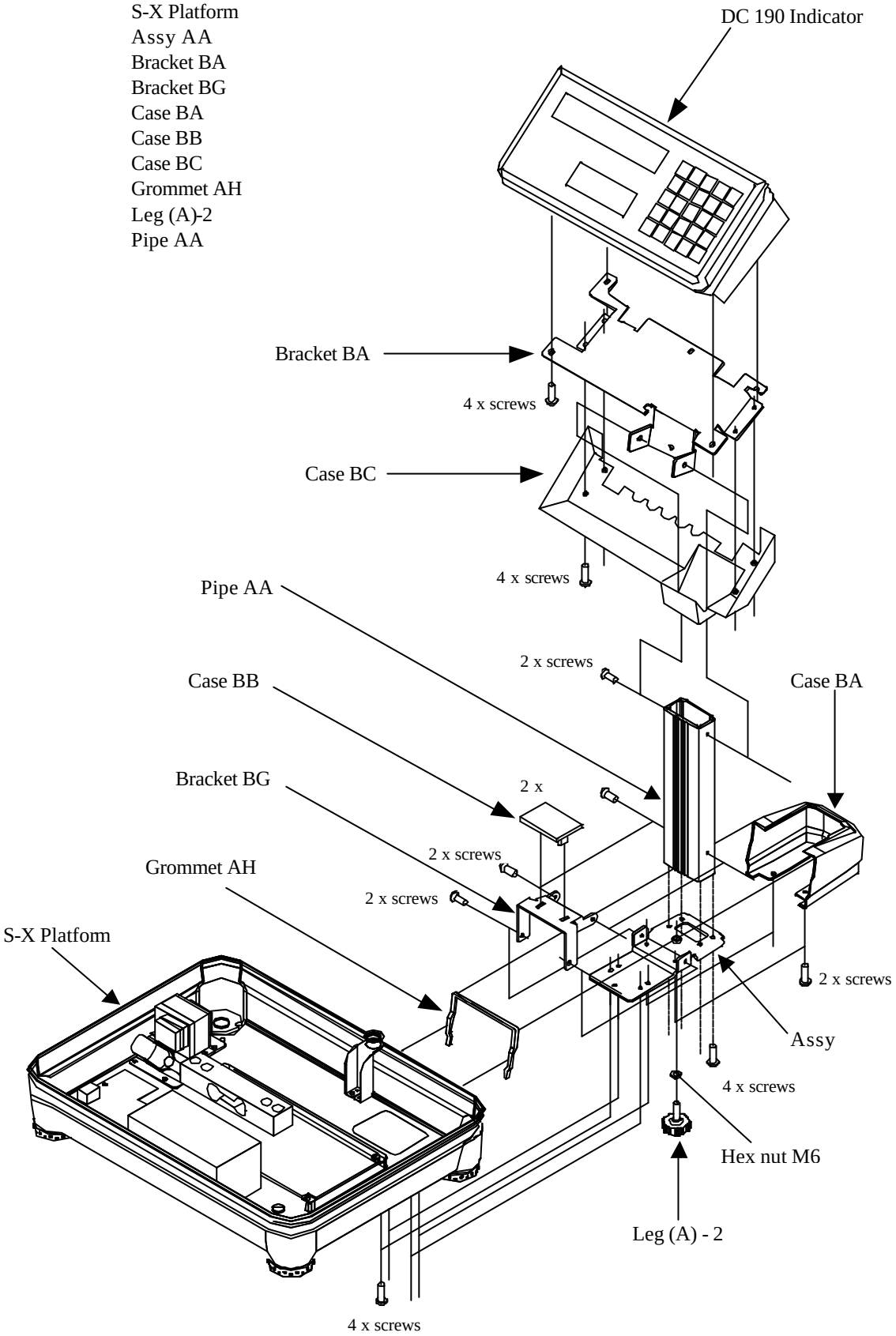
Part need : DC 190 Indicator
S-X Platform
Bracket AG



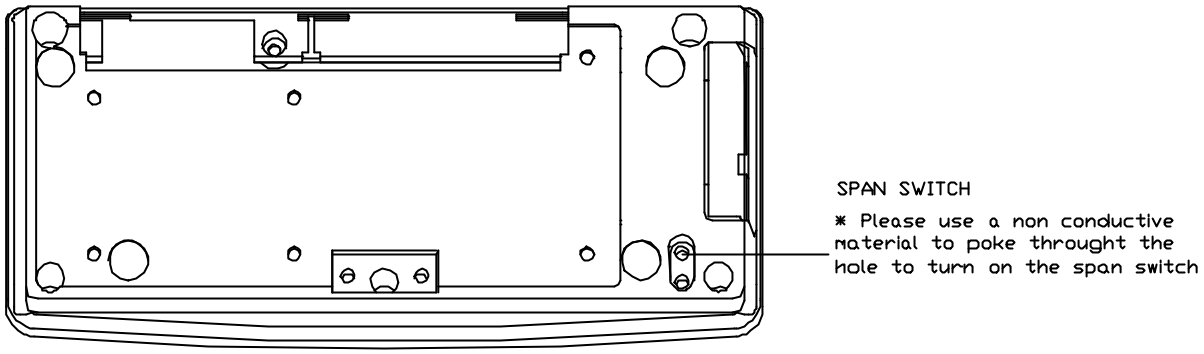
Bracket AG

4.1.2 DC 190 POLE TYPE SET UP

Parts need :
- DC 190 Indicator
- S-X Platform
- Assy AA
- Bracket BA
- Bracket BG
- Case BA
- Case BB
- Case BC
- Grommet AH
- Leg (A)-2
- Pipe AA

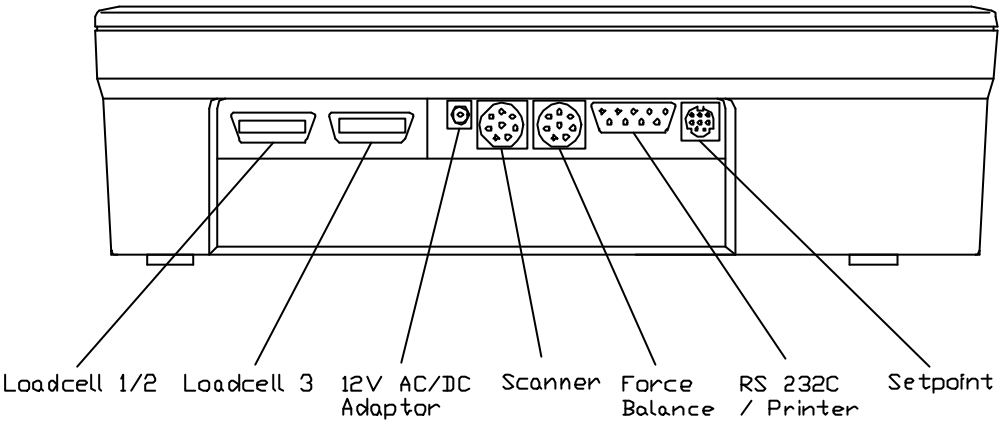


4.2 LOCATION OF SPAN SWITCH AND CONNECTOR.



** A sealing screw is screw onto the span switch hole.
Please remove the screw to access to the span switch.

Back view of DC 190



Top view of DC 190

4.3 DEFAULT SPEC

To default to the country specification

KEY T0 PRESS	DISPLAY			1	2	3	4	5	
	WEIGHT	UNIT WEIGHT	QUANTITY						
	0.0000	0	0	x				x	At weighting mode
[REZERO] + [1][2][4]	DFT	SPC 01							Go to Default SPEC mode.
[0]	DFT	SPC 01	0						Enter 00 – Japan 01 – USA 02 – Europe / SI
[*]	PROG		C00						To execute country default specification

INDICATOR : 1 = ZERO; 2 = INSUFFICIENT; 3 = PROG; 4 = KG; 5 = SCALE 1

4.4 CUSTOMER SPECIFICATION SETTING

To change or view the Customer SPEC Data.

KEY T0 PRESS	DISPLAY			1	2	3	4	5	
	WEIGHT	UNIT WEIGHT	QUANTITY						
	0.0000	0	0			x		x	At maintenance mode
[REZERO] + [1][4][1]	SPC00		0 0 0 0						At Customer Specification Mode
[+]	SPC01		0 0 0 0						To increase Spec no. and save spec before.
[1][0][1][1]	SPC01	1 0 1 1	0 0 0 0						Enter data to change eg. 0000 to 1011
[+]	SPC02		0 1 0 0						Save data and increase spec no.
[1][0][1][1]	SPC02	1 0 1 1	0 1 0 0						
[C]	SPC02		0 1 0 0						Clear data enter
[-]	SPC01		1 0 1 1						Decrease the SPEC no.
[*]	PROG		C 0 0						Save SPEC data and exit to programming mode.
[MODE]	0.0000	0	0	x	x		x	x	

INDICATOR : 1 = ZERO; 2 = INSUFFICIENT; 3 = PROG; 4 = KG; 5 = SCALE 1

4.5 WEIGHT & MEASURE SPECIFICATION SETTING

To check or change the Weight & Measure SPEC.
Please turn on the Span Switch when using this mode.

KEY T0 PRESS	DISPLAY			1	2	3	4	5	
	WEIGHT	UNIT WEIGHT	QUANTITY						
	0.0000	0	0			x		x	At maintenance mode
[REZERO]+ [1][4][2]	SPC20		0 0 0 0						At Weight & Measure Specification Mode
[+]	SPC21		0 0 1 1						To increase Spec no. and save spec before.
[1][0][1][0]	SPC21	1 0 1 0	0 0 1 1						Enter data to change eg. 0000 to 1011
[+]	SPC22		0 0 1 0						Save data and increase spec no.
[1][0][1][1]	SPC22	1 0 1 0	0 0 1 0						
[C]	SPC22		0 0 1 0						Clear data enter
[-]	SPC21		1 0 1 0						Decrease the SPEC no.
[*]	PROG		C 0 0						Save SPEC data and exit to programming mode.
[MODE]	0.0000	0	0	x	x		x	x	

INDICATOR : 1 = ZERO; 2 = INSUFFICIENT; 3 = PROG; 4 = KG; 5 = SCALE 1

4.6 INTERNAL COUNT AND A/D COUNT

To check the internal count of the A / D.

KEY TO PRESS	DISPLAY			1	2	3	4	5	
	WEIGHT	UNIT WEIGHT	QUANTITY						
	PROG		C 0 0			x		x	At maintenance mode
[REZERO] + [*][*][+]		0	50000				x	x	Unit weight display the internal count while the Quantity display the A/D count
[MODE]	PROG		C 0 0			x		x	Escape to maintenance mode
[MODE]	0.0000	0	0	x	x		x	x	Return to weighing mode

INDICATOR : 1 = ZERO; 2 = INSUFFICIENT; 3 = PROG; 4 = KG; 5 = SCALE 1/2/3/4

4.7 CALIBRATION

Calibrate the scale to it specific weight. Please turn on the Span switch when using this mode. Select the scale to calibrate before proceeds.

KEY T0 PRESS	DISPLAY			1	2	3	4	
	WEIGHT	UNIT WEIGHT	QUANTITY					
	S-ON							At S-ON display.
[REZERO] + [8][7][1][5]	1.2364		15641					Go to the calibration mode. Display shows zero count. If display shows – PRESS CODE LO-ERR or PRESS CODE HI-ERR - press [#] to auto compute the zero point. The zero count should be at 100,000 ± 20,000 range. If after auto compute, the zero count is not in range, press [+] key to increase or [-] to decrease the zero count until it is in range.
[REZERO]	0.0000		93234					Set to zero weight.
	5.2715	0	93234					Place weight on the platter e.g. 5 kg
[5][.][0][0][0] [0]	5.2715	5.0000	580397					Key in the weight on the platter e.g. 5 kg
[*]	- - - - - -	- - - - - -	- - - - - -					Compute the span calibration.
	1	00000	5500000					Weigh and Unit weight show the span count of the weight while the Quantity shows the count of zero + span.
[MODE]	S-ON							At S-ON display.
	0.0000	0	0	x	x	x	x	Push the span switch to return to normal

INDICATOR : 1 = ZERO; 2 = INSUFFICIENT; 3 = KG; 4 = SCALE 1/2/3/4

5 SPECIFICATION LIST (BASED ON VERSION 6.87)

5.1 SOFTWARE VERSION

REVISION NUMBER	MODIFICATION DETAIL	SOFTWARE VERSION
0.00	FIRST RELEASE OF NEW SPEC LIST	Ver1.04, Ver1.06 & Ver2.11
0.01	Removed DP122 spec and replace by LP2622 Add SPEC39 bit 0	Ver2.15 and above
0.02	Battery 1&2 Spec (SPEC32 bit 2, SPEC39 bit 1)	Ver 3.18 and above
0.03	Added tare Spec on SPEC0	Ver 2.20 and above
0.04	Change load Cell Sensitivities Table	Ver 2.22 and above
0.05	Changed to 16 bit CPU, added new mode (Job Schedule mode) and enable PC to multi-scale communication.	Ver 3.43 and above
0.06	Changed RS232 and Force Balance baud rate setting (1200 to 19200 and 2400 to 38400); Added SPEC43 bit 2 & 3 to set data receive waiting time.	Ver 3.45 and above
0.07	SPEC03 XX01 (12 Digits Teraoka Code) and SPEC03 00XX (12 Digits Numeric Number) are not used.	Ver 3.51 and above
0.08	Added notes 8) and 9).	Ver 3.54 and above
0.09	Added SPEC12 bit 1 if set to 0 to download label format for Eltron printer. Set to 1 for non-downloading.	Ver 3.70 and above
0.10	Added SPEC46 to select types of In and Out Inventory combination. Added SPEC39 to control AD Timing	Ver 3.72 and above
0.11	Added SPEC45 bit 0 and bit 1 to control Zero Tracking Speed.	Ver 3.78 and above
0.12	Added note 15. Added SPEC45 bit 3 to select TWB-01970 option board and TWB-01921 option board. Added SPEC45 bit 2 to select DP-122 printer or other printers.	Ver 3.79 and above
0.13	Changed Spec: The previous usage of SPEC19 bit 0 is changed to SPEC47 bit 0. Changed selection of Japan Force Balance using SPEC19 bit 1 only to selection using SPEC19 bit 0 & 1. Added New Spec: Added SPEC47 bit 1 to select webserver (6.84) and SPEC47 bit 2 for qty scanning (6.84). Added SPEC47 bit 3 to select label or receipt printing and SPEC47 bit 1 to enable Siteplayer/Ethernet (6.85). Added Spec48 bit 0 to select Epson printer (6.86).	Ver 3.80 and above; Ver 6.80 and above

5.2 CUSTOMER SPECIFICATION ([REZERO]+[1][4][1])

SPEC NO	BIT 3	BIT 2	BIT 1	BIT 0
0	**Tare when Scale Change** **0:** Old Tare (*2) **1:** New Tare	**Digital Tare Accumulation** **0:** No (*2) **1:** Yes	**0 :** Not Used	**0:** Not Used
1	**Power Auto Off Function** **0 0 0 0 :** Auto power off Disable when Net Weight = 0 **0 0 0 1 ~ 1 1 1 1 :** Duration to activate Power Off (in Minute)			
2	**Scale Specification (*3)** **0 0 :** Gram **0 1 :** Kg **1 0 :** Lb **1 1 :** Not Used		**Kg / Lb Lamp Inhibit** **0 :** No (*2) **1 :** Yes (*3)	**Inventory Display by Gross Key** **0 :** Gross Display (*7) **1 :** No of Inventory
3	**ID Code (Only for V2.xx) (*4)** **0 0 :** Not Used (*5) **0 1 :** 16 Digits Teraoka Code **1 0 :** Not Used (*5) **1 1 :** 16 Digits Numeric Number		**Entry Part No (*4)** **0 0 :** 12 Digits Numeric Number **0 1 :** Not Used (*5) **1 0 :** Not Used (*5) **1 1 :** 16 Digits Teraoka Code (V2.xx)	
4	**Set New Item Code during Normal Mode** **0 :** Yes **1 :** No	**Extent of Insufficient Samples** **0 0 :** 0.1 % **0 1 :** 0.2 % **1 0 :** 0.0 % **1 1 :** Not Used		**Negative Counting** **0 :** No **1 :** Yes
5	**Sampling Time for Unit Wt Calculation** **0 :** 10 times **1 :** 5 times	**Unit Weight Auto Recomputing** **0 :** No **1 :** Yes	**Date Order** **0 0 :** Year/Month/Day **0 1 :** Day/Month/Year **1 0 :** Not Used **1 1 :** Month/Day/Year	
6	**Display Accuracy of Unit Weight** **0 :** No **1 :** Yes	**Clear all Input Key in One Touch (V2.xx)** **0 :** Yes **1 :** No	**RS232 Continue Sending Rate to PC (V2.xx)** **0 :** High **1 :** Low	**Auto Shift to Next Position (Teraoka Code Entry)** **0 :** No **1 :** Yes
7	**Set Point Buzzer** **0 :** Yes **1 :** No	**Set Points Latching (V2.xx)** **0 :** Latch **1 :** No Latch	**Set Point Type** **0 0 :** % Quantity **1 0 :** Quantity **0 1 :** % Weight **1 1 :** Weight	
8	**RS232C Connection (Force Balance) (Optional)** **0 :** No **1 :** Yes	**RS232C Data Length (PC/Force Balance) (Optional)** **0 :** 7 bits **1 :** 8 bits	**RS232C Baud Rate (PC/Force Balance) (Optional)** **0 0 :** 19200 **1 0 :** 4800 **0 1 :** 38400 **1 1 :** 9600	
9	**RS232C Stop Bit (PC/Force Balance) (Optional)** **0 :** 1 bits **1 :** 2 bits	**Force Balance Type** **0 :** Japan **1 :** Export	**RS232C Parity Bit (PC/Force Balance) (Optional)** **0 0 :** No **1 0 :** Not Used **0 1 :** Odd **1 1 :** Even	
10	**RS232C Connection (PC/Printer)** **0 :** No **1 :** Yes	**RS232C Data Length (PC/Printer) (Optional)** **0 :** 7 bits **1 :** 8 bits	**RS232C Baud Rate (PC/Printer) (Optional)** **0 0 :** 19200 **1 0 :** 4800 **0 1 :** 38400 **1 1 :** 9600	

SPEC NO	Bit 3	Bit 2	Bit 1	Bit 0
11	**RS232C Stop Bit (PC/Printer) (Optional)** **0 :** 1 bit **1 :** 2 bits	**Printer Type (V2.xx)** **0 :** TVP Printer/ Eltron LP2622 or LP2722 **1 :** SE250/ EPSON Printer (*6)	**RS232C Parity Bit (PC/Printer) (Optional)** **0 0 :** No **1 0 :** Not Used **0 1 :** Odd **1 1 :** Even	
12	**RS232C Output (PC/Printer) (Optional)** **0 0 :** Not Available **0 1 :** When Counting Condition (PC) **1 0 :** By * Key (PC + Printer) **1 1 :** In Both Case		**ELTRON/TVP Printer Download Label Format** **0 :** Enable **1 :** Disable	**RS232C with Header (PC)** **0 :** Yes **1 :** No
13	**RS232C Header Send (PC) (V2.xx)** **0 :** Code **1 :** Title	**RS232C Connector** **0 0 0 :** D-Sub: Printer; DIN: Force Balance **0 0 1 :** D-Sub: Force Balance; DIN: Printer **0 1 0 :** D-Sub: Printer; DIN: PC (*1) **(V2.xx)** **0 1 1 :** D-Sub: PC; DIN: Printer (*1) **(V2.xx)** **1 0 0 :** D-Sub: PC; DIN: Force Balance **(V2.xx)** **1 0 1 :** D-Sub: Force Balance; DIN: PC **(V2.xx)** **1 1 0 - 1 1 1 :** Not Used		
14	**RS232C Connection (Barcode Scanner)** **0 :** No **1 :** Yes	**RS232C Data Length (Barcode Scanner) (Optional)** **0 :** 7 bits **1 :** 8 bits	**RS232 Baud Rate (Barcode Scanner) (Optional)** **0 0 :** 1200 **1 0 :** 4800 **0 1 :** 2400 **1 1 :** 9600	
15	**RS232C Stop Bit (Barcode Scanner) (Optional)** **0 :** 1 bits **1 :** 2 bits	**RS232C with Header (Barcode Scanner)** **0 :** Yes **1 :** No	**RS232C Parity Bit (Barcode Scanner) (Optional)** **0 0 :** No **1 0 :** Not Used **0 1 :** Odd **1 1 :** Even	
16	**Scale 1 (LED):** **0 0 :** Internal Scale 1 **0 1 :** Internal Scale 2 **1 0 :** External Scale **1 1 :** Force Balance		**Scale 2 (LED) :** **0 0 :** Internal Scale 1 **0 1 :** Internal Scale 2 **1 0 :** External Scale **1 1 :** Force Balance	
17	**Scale 3 (LED):** **0 0 :** Internal Scale 1 **0 1 :** Internal Scale 2 **1 0 :** External Scale **1 1 :** Force Balance		**Scale 4 (LED) :** **0 0 :** Internal Scale 1 **0 1 :** Internal Scale 2 **1 0 :** External Scale **1 1 :** Force Balance	
18	**Set Point TTL Output** **0 :** Active Low **1 :** Active High	**Number of Set Points** **0 0 0 :** 2 Set Points **0 0 1 :** 3 Set Points **0 1 0 :** 4 Set Points (Not Used for RS485 Network Card) **0 1 1 :** 5 Set Points (Not Used for RS485 Network Card) **1 0 0 :** 6 Set Points (Not Used for RS485 Network Card)		
19	**Display "Not F" message for item that is not stored in memory before (V2.xx)** **0 :** Yes **1 :** No	**Link to IMS (For US Version in V2.xx)** **0 :** No **1 :** Yes	**Type of Force Balance (Japan Version Only)** **0 0:** SHG-300 **0 1:** HR-200 **1 0:** HR-60 **1 1:** Not Used	

5.3 WEIGHT & MEASURE SPECIFICATION ([REZERO]+[1][4][2])

Please turn ON the span switch before proceed.

SPEC NO	BIT 3	BIT 2	**BIT 1**	BIT 0
20	**Minimum Display (Scale 1)** **0 0 :** 2 **1 0 :** 5 **0 1 :** 1 **1 1 :** 10		**Minimum Display (Scale 2)** **0 0 :** 2 **1 0 :** 5 **0 1 :** 1 **1 1 :** 10	
21	**0 :** Not Used	**Weight Decimal Point Position (Scale 1)** **0 0 0 :** 00000 **0 1 1 :** 00.000 **0 0 1 :** 0000.0 **1 0 0 :** 0.0000 **0 1 0 :** 000.00 **1 0 1 :** 0.00000 (*8)		
22	**0 :** Not Used	**Weight Decimal Point Position (Scale 2)** **0 0 0 :** 00000 **0 1 1 :** 00.000 **0 0 1 :** 0000.0 **1 0 0 :** 0.0000 **0 1 0 :** 000.00 **1 0 1 :** 0.00000 (*8)		
23	**Display Resolution** **0 0 :** 1/10,000 **1 0 :** 1/2,500 **0 1 :** 1/5,000 **1 1 :** Not Used		**Zero Setting Range** **0 0 :** + Unlimited **1 0 :** ± 10 % FS - 10 % FS **0 1 :** ± 2 % FS **1 1 :** Not Available	
24	**Masked Display at Minus Weight** **0 :** Gross **1 :** Net	**Display at Minus Weight** **0 :** Minus Display **1 :** Masked	**Zero Lamp Lighting Method** **0 :** Gross **1 :** Net	**When no AC, Display Mask when Battery Low or No Battery** **0 :** Yes **1 :** No
25	**Scale Starting Method** **0 :** Automatic **1 :** Manual	**IR Mode protected by Span Switch** **0 :** No **1 :** Yes	**Scale Type** **0 :** Single Scale **1 :** Double Scale	**Gross Mode Available** 0 : Yes 1 : No (*7)
26	**Zero Tracking when Tare** **0 :** Yes **1 :** No	**Weight Reset when Tare** **0 :** Yes **1 :** No	**Initial Start Range** **0 0 :** + Unlimited **1 0 :** ± 10 % FS - 10 % FS **0 1 :** ± 2 % FS **1 1 :** Not Available	
27	**Comma Display** **0 :** No **1 :** Yes	**Digital Tare Setting** **0 :** No **1 :** Yes	**Tare Range** **0 0 :** 100% FS **1 0 :** 5% FS **0 1 :** 50% FS **1 1 :** Not Available	
28	**Auto Tare Clear when Rezero** **0 :** No **1 :** Yes	**Automatic Unit Weight Clear Condition** **0 0 :** Over Net 5d and Gross 21d and Weight Stable **0 1 :** >= Net 1d and Weight Stable **1 0 :** >= Net 1d and Quantity > 0 and Weight Stable		**Automatic Unit Weight Clear** **0 :** No **1 :** Yes
29	**Digital Tare Rounding** **0 :** Tare Exactly **1 :** Round to Nearest Increment	**Tare Value Exchange** **0 :** Yes **1 :** No	**Tare Addition** **0 :** Yes **1 :** No	**Tare Subtraction** **0 :** Yes **1 :** No

SPEC NO	BIT 3	BIT 2	BIT 1	BIT 0
30	**Loadcell Sensitivities Selection (mV/V) (Scale 1)** **0 0 0 0** 4.00 **0 0 0 1** 3.76 **0 0 1 0** 3.52 **0 0 1 1** 3.28 **0 1 0 0** 3.04 **0 1 0 1** 2.80 **0 1 1 0** 2.56 **0 1 1 1** 2.32 **1 0 0 0** 2.08 **1 0 0 1** 1.84 **1 0 1 0** 1.60 **1 0 1 1** 1.36 **1 1 0 0** 1.12 **1 1 0 1** 0.88 **1 1 1 0** 0.64 **1 1 1 1** 0.40			
31	**Loadcell Sensitivities Selection (mV/V) (Scale 2)** **0 0 0 0** 4.00 **0 0 0 1** 3.76 **0 0 1 0** 3.52 **0 0 1 1** 3.28 **0 1 0 0** 3.04 **0 1 0 1** 2.80 **0 1 1 0** 2.56 **0 1 1 1** 2.32 **1 0 0 0** 2.08 **1 0 0 1** 1.84 **1 0 1 0** 1.60 **1 0 1 1** 1.36 **1 1 0 0** 1.12 **1 1 0 1** 0.88 **1 1 1 0** 0.64 **1 1 1 1** 0.40			
32	**Calibration / Default SPEC / SPEC 142 Mode Protected by Span Switch** **0 :** Yes **1 :** No	**Platform Battery Low Lamp** **0 :** Yes **1 :** No	**Auto Exit from Add Mode** **0 :** No **1 :** Yes	**External Loadcell (Scale 3)** **0 :** No **1 :** Yes
33	**Over Weight Mask at** **0 :** +1d **1 :** +9d	**Weight Decimal Point Position (Scale 3)** **0 0 0 :** 00000 **0 0 1 :** 0000.0 **0 1 0 :** 000.00	**0 1 1** : 00.000 **1 0 0 :** 0.0000	
34	**0 :** Not Used	**Loadcell Type (Scale 1)** **0 :** For Standard or Normal Loadcell **1 :** For Abnormal Loadcell with too Large Offset	**A/D Board (Scale 1)** **0 0 :** Normal **0 1 :** Prevent from Small Vibration / Fast Change in Display **1 0 :** Prevent from Medium Vibration **1 1 :** Prevent from Large Slow Change in Display	

SPEC NO	BIT 3	BIT 2	BIT 1	BIT 0
35	**0 :** Not Used	**Loadcell Type (Scale 2)** **0 :** For Standard or Normal Loadcell **1 :** For Abnormal Loadcell with too Large Offset	**A/D Board (Scale 2)** **0 0 :** Normal **0 1 :** Prevent from Small Vibration / Fast Change in Display **1 0 :** Prevent from Medium Vibration **1 1 :** Prevent from Large Slow Change in Display	
36	**Minimum Display (Scale 3)** **0 0 :** 2 **1 0 :** 5 **0 1 :** 1 **1 1 :** 10		**A/D Board (Scale 3)** **0 0 :** Normal **0 1 :** Prevent from Small Vibration / Fast Change in Display **1 0 :** Prevent from Medium Vibration **1 1 :** Prevent from Large Slow Change in Display	
37	**Loadcell Sensitivities Selection (mV /V) (Scale 3)** **0 0 0 0** 4.00 **0 0 0 1** 3.76 **0 0 1 0** 3.52 **0 0 1 1** 3.28 **0 1 0 0** 3.04 **0 1 0 1** 2.80 **0 1 1 0** 2.56 **0 1 1 1** 2.32 **1 0 0 0** 2.08 **1 0 0 1** 1.84 **1 0 1 0** 1.60 **1 0 1 1** 1.36 **1 1 0 0** 1.12 **1 1 0 1** 0.88 **1 1 1 0** 0.64 **1 1 1 1** 0.40			
38	**Loadcell Type (Scale 3)** **0 :** For Standard or Normal Loadcell **1 :** For Abnormal Loadcell with too Large Offset	**Digital Tare when Loaded** **0 :** Allow **1 :** Not Allow	**Internal Count (V2.xx)** **0 :** 500,000 **1 :** 1,000,000	**Stability Check when Changing Scale (V2.xx)** **0 :** Yes (*9) **1 :** No
39	**AD Timing Delay** **0 0 :** Default **0 1 :** Slow **1 0 :** Slower **1 1 :** Slowest		**Indicator Battery Low Lamp (V3.18 and above)** **0 :** Yes **1 :** No	**Rezero when Changing Scale (V2.15 and above)** **0 :** No **1 :** Yes (*9)

**** NOTE for SPEC 00 to SPEC 39**

*1) The Baud Rate, Data Length, Stop Bit and Parity setting for PC based on SPEC 08 and SPEC 09.
Also, when pressing valid print '*', '+' & '-' key, the scale will send data to PC.

*2) When SPEC 02 bit 1 set to '0' (Kg/Lb Lamp Not Inhabit), SPEC00 bit 3 & 2 can only set to '0'.

*3) When SPEC 02 bit 3 & 2 are set to 'Gram' then SPEC 02 bit 1 should set to '1'(Kg/Lb Lamp Inhabit).

*4) Some conditions applied when doing spec changing in SPEC 03. All item code memory must be cleared when changes in SPEC 03.

*5) When SPEC 03 bit 3 & 2 or bit 1 & 0 is set to 'Not Used', the software will automatically set the byte to '11'.

*6) To use EPSON printer, SPEC 11 bit 2 must set to '1' and SPEC 48 is set to '1'.
To choose SE250 (CO-STAR) printer, SPEC 11 bit 2 must set to '1' and SPEC 48 is set to '0'.

*7) To view Lot No using Gross Key in Normal Mode, must set SPEC25 bit 0 to 1 and set SPEC 02 bit 0 to 0.

*8) Only for Capacity of 0.50000kg

*9) When SPEC 39 bit 0 is set to '1', SPEC 38 bit 0 must set to '0'.

IMPORTANT:
Note that you need to change back the unit to the first unit before shifting scale to Force Balance.

5.4 MULTI-DROP HOST COMMUNICATION SPEC ([REZERO]+[1][4][3])

SPEC NO	BIT 3	BIT 2	BIT 1	BIT 0
40	**Scale Address (Most Significant Digit 0 to 9 – Maximum 3)**			
41	**Scale Address (Least Significant Digit 0 to 9)**			
42	**Save In Local Memory** **0 :** No **1 :** Yes	**Clear Display for Correct Transaction** **0 :** No (*1) **1 :** Yes	**0 :** Not Used	**Multi-Drop Host Comm** **0 :** Disabled **1 :** Enabled
43	**Receive Data Waiting Time** **0 0 :** 3 seconds **0 1 :** 5 seconds **1 0 :** 9 seconds **1 1 :** 15 seconds		**0 :** Not Used	**Enabled Polling with TNP Software** **0 :** No Polling **1 :** Polling
44	**Allow Different Quantity in Job Schedule** **0 :** No **1 :** Yes (*3)	**TNP Re-print** **0 :** Disable **1 :** Enable (*1)	**Job Schedule Barcode Scanning** **0 :** Disable **1 :** Enable	**Job Schedule Mode** **0 :** Disable **1 :** Enable
45	**Select Option Board Used** **0 :** TWB-01921 **1 :** TWB-01970 (*2)	**Select DP-122 Printer or other printers** 0 : **Others** 1 : **DP-122**	**Zero Tracking Speed** **0 0 : Slow** **1 0 : Fast** **0 1 : Average** **1 1 : Fastest**	
46	**Allow Manual Quantity Entry in Job Schedule** **0 :** No **1 :** Yes (*3)	**Selection of Incoming or Outgoing or Non In and Out Inventory** **000 :** In/Out/Non **100 :** In **001 :** In/Out **101 :** Out **010 :** In/Non **110 :** Non **011 :** Out/Non **111 :** Not Used		
47	**Print Label or Receipt using TVP printer.** **0 :** Label **1 :** Receipt	**Go to Weighing Mode when Scan Quantity** **0 :** No (TOTAL mode) **1 :** Yes	**Connection to Webserver (SitePlayer)** **0 :** Disable **1 :** Enable	**Print When Pressing + or – key in Add Mode** **0 :** Yes **1 :** No
48	**0 0 0 :** Not Used			**Label Writer Printer Select** **0 :** SE250 **1 :** EPSON

****Note for SPEC 40 to SPEC 48**

*1) To reprint a label in TNP, you need to set SPEC 42 bit 2 to 0 and SPEC 44 bit 2 to 1.
Important: In order to reprint, the user is not allow to press other key besides the previous key that he/she has pressed for printing. Meaning if the user pressed */print key to print a label, he/she must press the same key to reprint the label.

*2) Cannot use set point 4 to set point 6 for new option board (TWB-01970).

*3) In order to allow Manual Quantity Entry in Job Schedule (SPEC46 bit 3 to '1'), must set SPEC44 bit 3 to '1' for this operation to take effect.

6 PC CONNECTION

6.1 GENERAL SPECIFICATION

Baud Rate	:	4800 / 9600 / 19200 / 38400 bps	(SPEC 10 bit 1 & 0)
Data Length	:	7 bits / 8 bits	(SPEC 10 bit 2)
Parity	:	None / Odd / Even	(SPEC 11 bit 1 & 0)
Stop Bit	:	1 bit / 2 bits	(SPEC 11 bit 3)

6.2 DC 190 TO PC OUTPUT DATA FORMAT

6.2.1 With Header (SPEC12 bit 0 set to 0)

The PC communication protocol is divided in 2 types. The first type is the old communication protocol and the second type is the new communication protocol. This new protocol is specially designed to cater for multi-scale to PC communication through the Digi Track N Print (TNP) software. In order to use the new protocol, SPEC42 bit 0 must be set to 1 else the DC190 will use the old protocol for communication.

The differences between the two protocols are as described below:

A1) Old Protocol (SPEC42 bit 0 set to 0)

HEADER	DATA	CR	HEADER	.....	CR	LF

One Data consists of “HEADER”, “DATA” & “CR”.
“CR” must be added at the end of the data.
“LF” must be added at the end as a termination code of the transmission.

A2) New Protocol (SPEC42 bit 0 set to 1)

REQUEST/ UPDATA CODE	?	Station Address	CR

HEADER	DATA	CR	HEADER	.....	CR	BCC	LF

A3) **The REQUEST/UPDATE CODE** fields can only be represented by the following codes:

REQUEST/UPDATE CODE	DATA
<EOT>	End of Transmission (No Error)
<ESC>	End of Transmission (Error Occurred)
<ENQ>	DC190 request for data
<STX>	PC or DC190 send data
<DC1>	Network printing
<DC2>	Incoming Job Schedule
<DC3>	Out going Job Schedule
<ACK>	DC190 acknowledge to Host to start sending Label printing data
<CAN>	Send by Host to indicate End of network label printing data
<DC4>	Send by Host to update current DC190 spec
<SO>	Host send Hardware key for DC190 to decode

The data after the REQUEST/UPDATE CODE must be the scale address that is represented by H'3F (?) and a 2 digit Scale Address.

One Data consists of "HEADER", "DATA" & "CR".
"CR" must be added at the end of the data.
"LF" must be added at the end as a termination code of the transmission.

(Note that the characters in the "DATA" file cannot be <LF> or <CR> because both of it are Control Characters.)

"BCC" is the Checksum. The BCC calculation starts with HEX Character 7F and XOR from first data to the last <CR> of the data being sent out. Take note that not every string of data being sent out has BCC. Refer to part (D) of this section for the complete protocol.

A4) In order to use the new protocol you must set the following SPEC:

Communication SPEC : SPEC 8 to 13 and 19

SPEC NO	Bit 3	Bit 2	Bit 1	Bit 0
8	**RS232C Connection (Force Balance)** **0 :** No **1 :** Yes	**RS232C Data Length (PC/Force Balance) (Optional)** **0 :** 7 bits **1 :** 8 bits	**RS232C Baud Rate (PC/Force Balance) (Optional)** **0 0 :** 19200 **1 0 :** 4800 **0 1 :** 38400 **1 1 :** 9600	
9	**RS232C Stop Bit (PC/Force Balance) (Optional)** **0 :** 1 bits **1 :** 2 bits	**Force Balance Type** **0 :** Japan **1 :** Export	**RS232C Parity Bit (PC/Force Balance) (Optional)** **0 0 :** No **1 0 :** Not Used **0 1 :** Odd **1 1 :** Even	
10	**RS232C Connection (PC/Printer)** **0 :** No **1 :** Yes	**RS232C Data Length (PC/Printer) (Optional)** **0 :** 7 bits **1 :** 8 bits	**RS232C Baud Rate (PC/Printer) (Optional)** **0 0 :** 19200 **1 0 :** 4800 **0 1 :** 38400 **1 1 :** 9600	
11	**RS232C Stop Bit (PC/Printer) (Optional)** **0 :** 1 bit **1 :** 2 bits	**Printer Type (V2.xx)** **0 :** TVP Printer/ Eltron LP2622 or LP2722 **1 :** SE250/ EPSON Printer (*6)	**RS232C Parity Bit (PC/Printer) (Optional)** **0 0 :** No **1 0 :** Not Used **0 1 :** Odd **1 1 :** Even	
12	**RS232C Output (PC / Printer) (Optional)** **0 0 :** Not Available **0 1 :** When Counting Condition (PC) **1 0 :** By * Key (PC + Printer) **1 1 :** In Both Case		**ELTRON/TVP Printer Download Label Format** **0 :** Enable **1 :** Disable	**RS232C with Header (PC)** **0 :** Yes **1 :** No
13	**RS232C Header Send (PC) (V2.xx)** **0 :** Code **1 :** Title	**RS232C Connector** **0 0 0** : Printer / Force Balance **0 0 1 :** Force Balance / Printer **0 1 0 :** Printer / PC (*1) **(V2.xx)** **0 1 1 :** PC / Printer (*1) **(V2.xx)** **1 0 0 :** PC / Force Balance **(V2.xx)** **1 0 1 :** Force Balance / PC **(V2.xx)** **1 1 0 - 1 1 1 :** Not Used		
19	**Display "Not F" message for item that is not stored in memory before (V2.xx)** **0 :** Yes **1 :** No	**Link to IMS (For US Version in V2.xx)** **0 :** No **1 :** Yes	**Type of Force Balance (Japan Version Only)** **0 0:** SHG-300 **0 1:** HR-200 **1 0:** HR-60 **1 1:** Not Used	

Note:

1) The Baud Rate, Data Length, Stop Bit and Parity setting for PC based on SPEC 08 and SPEC 09. Also, when pressing valid print '', '+' and '-' key, the scale will send data to PC.

Multi-Drop Host Communication SPEC : (SPEC 40 to 44)

SPEC NO	BIT 3	BIT 2	BIT 1	BIT 0
40	**Scale Address (Most Significant Digit 0 to 9 – Maximum 3)**			
41	**Scale Address (Least Significant Digit 0 to 9)**			
42	**Save In Local Memory** **0 :** No **1 :** Yes	**Clear Display for Correct Transaction** **0 :** No (*1) **1 :** Yes	**0 :** Not Used	**Multi-Drop Host Comm** **0 :** Disabled **1 :** Enabled
43	**Receive Data Waiting Time** **0 0 :** 3 seconds **0 1 :** 5 seconds **1 0 :** 9 seconds **1 1 :** 15 seconds		**0 :** Not Used	**Enabled Polling with TNP Software** **0 :** No Polling **1 :** Polling
44	**Allow Different Quantity in Job Schedule** **0 :** No **1 :** Yes	**TNP Re-print** **0 :** Disable **1 :** Enable (*1)	**Job Schedule Barcode Scanning** **0 :** Disable **1 :** Enable	**Job Schedule Mode** **0 :** Disable **1 :** Enable

Example:

Set the following Specs:

Baud Rate	: 9600 bps	(Spec 10 bits 1 & 0) Or (Spec8 bit 1 & 0)
Data Length	: 8 bits	(Spec 10 Bit 2) Or (Spec8 Bit 2)
Parity	: None	(Spec 11 Bit 1 & 0) Or (Spec9 Bit 1 &0)
Stop Bit	: 1 bit	(Spec 11 Bit 3) Or (Spec 9 Bit 3)
* RS232 Output	: By "*"Key	(Spec 12 Bit 3 & 2)
* RS232 With Header	: 0: Yes	(Spec 12 Bit 0)
* RS232 Header	: 0: Code	(Spec 13 bit 3)
RS232 Connection	: 1: Yes	(Spec 10 bit 3)
RS232 Connector	: PC	(Spec13 bit 2,1,0: 010, 011, 100 or 101)
Display "Not F" Msg	: 1: No	(Spec19 bit 3)
Link to IMS Software	: 1: Yes	(Spec 19 bit 2)
(For US Only Version Only)		

Scale Address	: 01	(Spec40 & Spec41)
* Multi-Drop Host Comm	: 1: Enable	(Spec 42 bit 0) - Using New Protocol
Job Schedule	: 0: Disable	(Spec 44 bit 0) - Disable Job Schedule

Note:
When using the new protocol those fields mark with * must be set as the example above.

A5) There are 2 type of Headers which is controlled by SPEC 13 bit 3

i) Header Code (SPEC 13 bit 3 set to 0)
ii) Title (SPEC 13 bit 3 set to 1)

(i) HEADER WITH HEADER CODE (SPEC 13 bit 3 set to 0)

Header Code is sent before the "data" to indicate type of the data.
The table below shows the type of data and its corresponding data length that can be sent:

Header Code	ASCII Code	Data	Data Length (Bytes)
0	30	Net Weight	MAX 5+1
1	31	Unit Weight	MAX 5+1
2	32	Quantity	MAX 7
3	33	ID Code	32
4	34	Tare Weight	MAX 5+1
A	41	Gross Weight	MAX 5+1
B	42	Status	3
C	43	Date &Time	12
E	45	Lot No	32
F	46	Set Point 1 [W]	MAX 7
G	47	Set Point 1 [Q]	MAX 7
H	48	Set Point 2	MAX 7
I	49	Total Quantity	MAX 7
K	4B	Inventory	8
M	4D	Part No	MAX 32
N	4E	Part Name	32
V	56	Scale No (1-4)	1
Q	51	Set Point 3	MAX 7
X	58	Set Point 4	MAX 7
U	55	Set Point 5	MAX 7
O	4F	Set Point 6	MAX 7
?	3F	Scale Address	2
J	4A	Job Schedule No	4
~	7E	Error Message Type	2
z	7A	Spec Downloading	80
a	61	Command	2
b	62	Span Data	6
c	63	Calibration Data	6

(ii) HEADER WITH TITLE

Title is sent before the data to indicate type of the data.
This can be used only when RS232 Output is set to Counting Condition, With Header and Title.

The following type of data can be sent:

Title	Data
NET WEIGHT	Net Weight
UNIT WEIGHT	Unit Weight
QUANTITY	Quantity
ID CODE	ID Code
TARE	Tare Weight
GROSS WEIGHT	Gross Weight
STATUS	Status
DATE & TIME	Date &Time
SET P1(W)	Set Point 1 [W]
SET P1(Q)	Set Point 1 [Q]
SET P2	Set Point 2
TOTAL QUANTITY	Total Quantity
INVENTORY	Inventory
PART NO	Part No
PART NAME	Part Name
LOT NO	Lot No
SCALE NO	Scale No
SET P3	Set Point 3
SET P4	Set Point 4
SET P5	Set Point 5
SET P6	Set Point 6
JOB NO	Job Schedule No

6.2.2 Without Header (SPEC12 BIT 0 set to 1)

DATA	CR	DATA	CR	.....	CR	LF

One Data consists of "DATA" & "CR".
"CR" must be added at the end of the data.
"LF" must be added at the end as a termination code of the transmission.

6.2.3 DATA

(i) ID Code

Parts Code is only sent when a PLU is called during the Counting Mode.
No of digit is from 1 to 32 digits. If the ID code is less than 32 digits, then the rest of the data will be filled with space (20H).

Example : Parts Code = 12

Header <---------- DATA ----------->

3	1	2	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	CR

(ii) Set Points

Set Points data are only sent when a PLU is called during the Counting Mode.
There are 6 set point data to be sent: Set Point 1 (F or G), Set Point 2 (H), Set Point 3(Q), Set Point 4(X), Set Point 5(U) and Set Point 6 (O).

Set Point 1
(F) Weight : Variable Length - Max 5 digits and 1 decimal point. OR
(G) Quantity : Variable Length - Max 7 digits.

(**Note** : Only one of "F" (Set 1 Weight) or "G" (Set 1 Quantity) is sent.)

Set Point 2 to 6 (H, Q, X, U, O)
Percentage : Variable length, Max 5 digits and 1 decimal point. OR
Lower Weight : Variable length, Max 5 digits and 1 decimal point. OR
Lower Quantity : Variable length, Max 7 digits.

4 combinations of Set Point 1 and Set Point 2 to 6 can be sent as follows:

SET 1		SET 2,3,4,5,6
* Quantity	&	Percentage
* Upper Quantity	&	Lower Quantity
** Weight	&	Percentage
** Upper Weight &		Lower Weight

Note:
1. * Set Point 1 must be set to Quantity ("G").
2. ** Set Point 1 must be set to Weight ("F").
3. Set Point 2 to 6 must either increase or decrease.
4. The Number of Decimal Point for Weight Set Point 2 to 6 must be the same as the Number of Decimal Point in Set Point 1.
5. For Percentage, the Maximum Number of Decimal Point is 2.

(iii) Gross Weight

Variable Length - Max 5 digits and 1 decimal point.

(iv) Net Weight

Variable Length - Max 5 digits and 1 decimal point.

(v) Unit Weight

Variable Length - Max 5 digits and 1 decimal point.

(vi) Tare Weight

Variable Length – Max 5 digits and 1 decimal point.

Note:
When Host sends tare weight with all spacing :

4	SP	SP	SP	SP	SP	CR

DC 190 will ignored the tare value and remains its current tare value.

(vii) Quantity

Variable Length - Max 7 digits.

(viii) Total Quantity

Variable Length - Max 7 digits sent when PRINT key is depressed.

Note:
Only one of "2" (Quantity) or "I" (Total Quantity) is sent at a time.
Total Quantity will be sent when in ACC or SUB mode.

(ix) Status

The status data byte is as follows:

1st byte:

Bit #	If set to **1**	If set to **0**
Bit 0	Positive weight	Negative weight
Bit 1	Lb mode	kg, g mode
Bit 2	Weight stable	Weight unstable
Bit 3	Output key in data	Others
Bit 4	Output by + key	Others
Bit 5	Output by - key	Others
Bit 6	Always set to "1"	
Bit 7	Always set to "0"	

When bit 3 (Output key in data) is "1", bit 2 (weight stable) should be ignored.

2nd Byte:

\+ : Inventory In Lamp On.
\- : Inventory Out Lamp On
* : All Inventory Lamp Off.

3rd Byte:

Bit #	If set to **1**	If set to **0**
Bit 0	Network Printer	Local Printer
Bit 1	Re-print TNP Labels	No Re-print
Bit 2	Don't Print Label	Print Label
Bit 3	X	X
Bit 4	X	X
Bit 5	X	X
Bit 6	Always set to "1"	
Bit 7	Always set to "0"	

Bit 2 – Re-print TNP Label in Job Schedule and in Normal Mode
Bit 3 – SPEC 47 bit 0 to print or not to print when +/- key is pressed

(x) Part No

32 digits.
If 12 digits Part Number is set using SPEC 03, DC 190 will send out 12 characters only.

(xi) Lot No

32 digits.

(xii) Inventory

8 digits.

Note:
1) When HOST send inventory data with all spacing, DC 190 should ignored it, otherwise it need to be overwritten by the new value.
2) For negative inventory data, the negative sign (-) will place in the beginning of the inventory data

(xiii) Part Name

32 digits.

Note:
For Part No, Lot No, Inventory and Part Name, if the number of bytes of data is less than the data length, the rest of the data will be filled with space (20H).

(xiv) Scale No

1 digit.

(xv) Date & Time

12 digits.

Header (C)	YEAR (2 DIGIT)	MONTH (2 DIGIT)	DATE (2 DIGIT)	HOUR (2 DIGIT)	MINUTE (2 DIGIT)	SEC (2 DIGIT)	CR

Note:
1. For ID Code, Part Name, Lot Number and Part Number, refer to Appendix A for Teraoka Code key.

(xvi) Scale Address

2 digits.

(xvii) Job Schedule Number

4 digits.

(xviii) Error Message Type

2 digits.

(xix) Download SPEC

80 digits.

The scale will not modify or update SPEC 20 to SPEC 39 because these are the Weight and Measurement SPECs which are not allowed to be modified.

(xx) Calibration Command

2 digits

Command Descriptions
1) a00 – Beginning of Calibration **(Calibration Command)**
2) a01 – Go into Calibration Mode with Weight and Span Data Display (Re-Zero 8715) **(Calibration Command)**
3) a02 – Searching for Zero Setting Point (Code (#) key press). **(Calibration Command)**
4) a03 – Re-Zero Command (Press Re-Zero key in DC 190). **(Calibration Command)**
5) a04 – Request DC190 to save the current SPAN Data. **(Calibration Command)**
6) a05 – Request for DC 190 to save the Span Data and Exit to Internal Count Mode. **(Calibration Command)**
7) a06 – DC 190 will send SPEC Data to Host. **(SPEC Downloading Command)**
8) a07 – Save SPEC Data into DC 190. **(SPEC Downloading Command)**
9) a99 – Exit Calibration Mode. **(Calibration Command)**

(xxi) Span Data

Max 6 digits

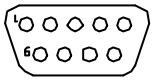
Scale will send Span Data consisting maximum of 6 digits during PC Calibration

(xxii) Calibration Data

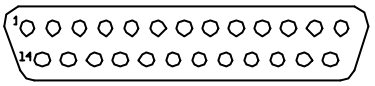
Max 5 digits and a decimal point.

During PC Calibration, PC will send this value to DC 190.

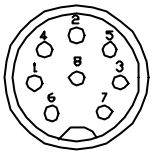
6.3 WIRE CONFIGURATION



9 PIN D-SUB CONNECTOR
BACK VIEW (FEMALE)



25 PIN D-SUB CONNECTOR
BACK VIEW (FEMALE)



8 PIN DIN PLUG
BACK VIEW (MALE)

PC **DC 190**

9 PIN D-SUB (FEMALE) **8 PIN DIN (MALE)**

PIN	SIGNAL
2	RXD
3	TXD
5	GND
4	DTR
6	DSR
7	RTS
8	CTS

SIGNAL	PIN
RXD	4
TXD	5
GND	2

25 PIN D-SUB (FEMALE) **8 PIN DIN (MALE)**

PIN	SIGNAL
2	TXD
3	RXD
7	GND
4	RTS
5	CTS
6	DSR
20	DTR

SIGNAL	PIN
RXD	4
TXD	5
GND	2

9 PIN D-SUB (FEMALE) **9 PIN D-SUB (MALE)**

PIN	SIGNAL
3	TXD
2	RXD
5	GND
4	DTR
6	DSR
7	RTS
8	CTS

SIGNAL	PIN
RXD	2
TXD	3
GND	5

25 PIN D-SUB (FEMALE) **9 PIN D-SUB (MALE)**

PIN	SIGNAL
2	TXD
3	RXD
7	GND
4	RTS
5	CTS
6	DSR
20	DTR

SIGNAL	PIN
RXD	2
TXD	3
GND	5

7 PRINTER CONNECTION

DC 190 can be connected to TVP Printer / ELTRON Printer LP2622 and LP2722, and SE250 / EPSON Printer.

7.1 CONNECTION TO TVP / ELTRON PRINTER

Set the following SPEC :

Baud Rate	: 9600	(SPEC 10 bit 1 & 0)
Data Length	: 8 bits	(SPEC 10 bit 2)
Parity	: None	(SPEC 11 bit 1 & 0)
Stop Bit	: 1 bit	(SPEC 10 bit 3)
Printer Type	: TVP / ELTRON	(SPEC 11 bit 2)
TVP/ELTRON Printer Download Label Format	: 0	(SPEC 12 bit 1)
RS232 Output	: By * Key	(SPEC 12 bit 3 & 2)

Note:
User can choose whether to download 6 default label formats to TVP/ELTRON when DC 190 is power up.

1. If this option is enable user will have to power up the printer first before DC 190 is power up.

2. If this option is disable there's no restriction on the power up sequence between DC190 and printer.

7.2 CONNECTION TO SE250 / EPSON PRINTER

Set the following SPEC :

Baud Rate	: 9600 bps	(Spec10 bits 1 & 0)
Data Length	: 8 bits	(Spec10 Bit 2)
Parity	: None	(Spec11 Bit 1 & 0)
Stop Bit	: 1 bit	(Spec11 Bit 3)
Printer Type	: SE250 / EPSON	(Spec11 Bit 2)
RS232 Output	: By * Key	(Spec12 Bit 3 & 2)

7.3 RS232 RELATED SPEC LIST : SPEC 8 to 13

The following SPEC must be set correctly for DC190 to communicate with the Printer.

SPEC NO	Bit 3	Bit 2	Bit 1	Bit 0
8	**RS232C Connection (Force Balance)** **0 :** No **1 :** Yes	**RS232C Data Length (PC/Force Balance) (Optional)** **0 :** 7 bits **1 :** 8 bits	**RS232C Baud Rate (PC/Force Balance) (Optional)** **0 0 :** 19200 **1 0 :** 4800 **0 1 :** 38400 **1 1 :** 9600	
9	**RS232C Stop Bit (PC/Force Balance) (Optional)** **0 :** 1 bits **1 :** 2 bits	**Force Balance Type** **0 :** Japan **1 :** Export	**RS232C Parity Bit (PC/Force Balance) (Optional)** **0 0 :** No **1 0 :** Not Used **0 1 :** Odd **1 1 :** Even	
10	**RS232C Connection (PC/Printer)** **0 :** No **1 :** Yes	**RS232C Data Length (PC/Printer) (Optional)** **0 :** 7 bits **1 :** 8 bits	**RS232C Baud Rate (PC/Printer) (Optional)** **0 0 :** 19200 **1 0 :** 4800 **0 1 :** 38400 **1 1 :** 9600	
11	**RS232C Stop Bit (PC/Printer) (Optional)** **0 :** 1 bit **1 :** 2 bits	**Printer Type (V2.xx)** **0 :** TVP Printer/ Eltron LP2622 or LP2722 **1 :** SE250/ EPSON Printer (*6)	**RS232C Parity Bit (PC/Printer) (Optional)** **0 0 :** No **1 0 :** Not Used **0 1 :** Odd **1 1 :** Even	
12	**RS232C Output (PC/Printer) (Optional)** **0 0 :** Not Available **0 1 :** When Counting Condition (PC) **1 0 :** By * Key (PC + Printer) **1 1 :** In Both Case		**ELTRON/TVP Printer Download Label Format** **0 :** Enable **1 :** Disable	**RS232C with Header (PC)** **0 :** Yes **1 :** No
13	**RS232C Header Send (PC) (V2.xx)** **0 :** Code **1 :** Title	**RS232C Connector** **D-Sub** **DIN** **0 0 0** : Printer Force Balance **0 0 1 :** Force Balance Printer **0 1 0 :** Printer PC (*1) **(V2.xx)** **0 1 1 :** PC Printer (*1) **(V2.xx)** **1 0 0 :** PC Force Balance **(V2.xx)** **1 0 1 :** Force Balance PC **(V2.xx)** **1 1 0 - 1 1 1 :** Not Used		

Note:

6) The Baud Rate, Data Length, Stop Bit and Parity setting for PC based on SPEC 08 and SPEC 09. Also, when pressing valid print '', '+' and '-' key, the scale will send data to PC.

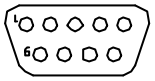
Export Default SPEC:

SPEC 8 : 0010
SPEC 9 : 0011

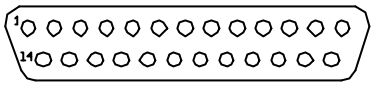
SPEC 10:	0010
SPEC 11:	0011
SPEC 12:	0000
SPEC 13:	0000

Note:
SPEC10 bit 3 for RS232 Connection is disabled in Default SPEC.
SPEC 13 bit 0, 1 & 2 need to be changed before using the Printer.

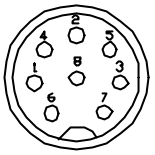
7.4 WIRE CONFIGURATION



9 PIN D-SUB
BACK VIEW (FEMALE)



25 PIN D-SUB CONNECTOR
BACK VIEW (FEMALE)



8 PIN DIN PLUG
BACK VIEW (MALE)

Printer **DC 190**

9 PIN D-SUB (FEMALE) **8 PIN DIN (MALE)**

PIN	SIGNAL
2	RXD
3	TXD
5	GND
4	DTR
6	DSR
7	RTS
8	CTS

SIGNAL	PIN
RXD	4
TXD	5
GND	2

25 PIN D-SUB (FEMALE) **8 PIN DIN (MALE)**

PIN	SIGNAL
2	TXD
3	RXD
7	GND
4	RTS
5	CTS
6	DSR
20	DTR

SIGNAL	PIN
RXD	4
TXD	5
GND	2

9 PIN D-SUB (FEMALE) **9 PIN D-SUB (MALE)**

PIN	SIGNAL
3	TXD
2	RXD
5	GND
4	DTR
6	DSR
7	RTS
8	CTS

SIGNAL	PIN
RXD	2
TXD	3
GND	5

25 PIN D-SUB (FEMALE) **9 PIN D-SUB (MALE)**

PIN	SIGNAL
2	TXD
3	RXD
7	GND
4	RTS
5	CTS
6	DSR
20	DTR

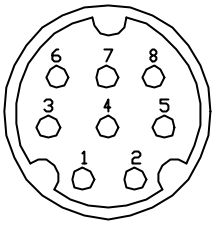
SIGNAL	PIN
RXD	2
TXD	3
GND	5

8 SET POINT CONNECTION

The number of set point can be set by changing the SPEC setting. The maximum number of set point is 6. It needs an external voltage (5~24 V) to drive the Set Points.

8.1 PIN CONFIGURATION

PIN	SIGNAL
1	Set Point 1
2	Set Point 2
3	Set Point 3
4	Set Point 4
5	Set Point 5
6	Set Point 6
7	External Voltage*
8	GND



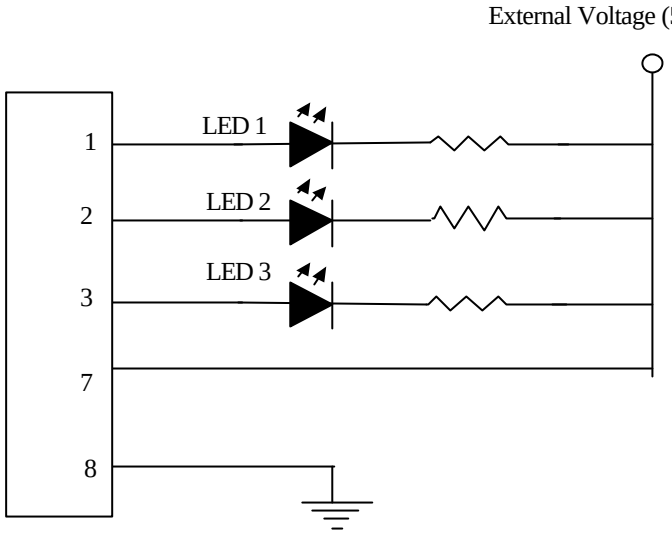
8 Pin Mini DIN Plug
Front View

* External voltage is from the range 5 to 24 V DC.

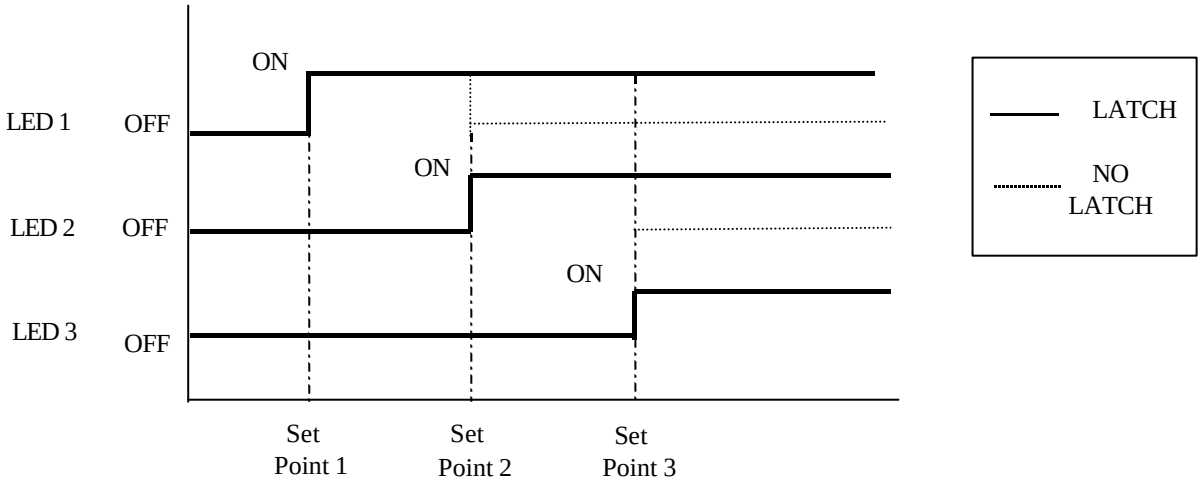
8.2 SET POINT SPEC SETTING

SPEC NO	Bit 3	Bit 2	Bit 1	Bit 0
7	**Set Point Buzzer** **0 :** Yes **1 :** No	**Set Points Latching (V2.xx)** **0 :** Latch **1 :** No Latch	**Set Point Type** **0 0 :** % Quantity **1 0 :** Quantity **0 1 :** % Weight **1 1 :** Weight	
18	**Set Point TTL Output** **0 :** Active low **1 :** Active high	**Number of Set Points** **0 0 0 :** 2 Set Points **0 0 1 :** 3 Set Points **0 1 0 :** 4 Set Points (Not Used for RS485 Network Card) **0 1 1 :** 5 Set Points (Not Used for RS485 Network Card) **1 0 0 :** 6 Set Points (Not Used for RS485 Network Card)		

8.3 SET POINT SET UP



Below is a chart that show when the LEDs will be light up in latch and no latch condition as per above set up when set point is reach.



LATCHING

When set point 1 is reach e.g. set point 1 is set to 1,000 pcs and 1,000 pcs is reach or over, LED 1 will light up.

When set point 2 is reach, LED 1 and 2 would light up together.

When set point 3 is reach, LED 1, 2 and 3 would light up together.

NO LATCHING

When set point 1 is reach, LED 1 will light up while LED 2 and 3 will be off.

When set point 2 is reach, LED 2 will light up while LED 1 and 3 will be off.

When set point 3 is reach, LED 3 will light up while LED 1 and 2 will be off.

9 BARCODE SCANNER CONNECTION

DC 190 can support these Barcode Scanners :

TTL TYPE (AA ONLY)
Pen Scanner - TESCO TE610RN – Support up to 12 digits

***REMARK** : Short 2-3 of JP1 and 1-2 of JP2 on Main board TWB-01900 when using TTL Barcode Scanner.

RS232C TYPE
Pen Scanner - ZEBEX ZB-800R
Handheld Scanner - PSC Quickscan Scanner

***REMARK** : Short 1-2 of JP1 and 2-3 of JP2 on Main board TWB-01900 when using RS232C Barcode Scanner.

9.1 GENERAL SPECIFICATION

Baud Rate	:	1200 / 2400 / 4800 / 9600 bps	(SPEC 14 bit 1 & 0)
Data Length	:	7 bits / 8 bits	(SPEC 14 bit 2)
Parity	:	None / Odd / Even	(SPEC 15 bit 1 & 0)
Stop Bit	:	1 bit / 2 bits	(SPEC 15 bit 3)
Barcode Type	:	CODE 39	

9.2 DEFAULT SPEC OF BARCODE SCANNER

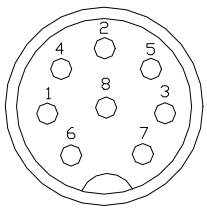
TTL Pen Scanner, TE610RN
4800 bps, 7 bits, Even and 1 stop bit

Pen Scanner, ZB-800R
9600 bps, 8 bits, None parity and 1 stop bit

Handheld Scanner, PSC Quickscan
9600 bps, 7 bits, None parity and 1 stop bit

Handheld Scanner, PSC Quickscan 6000
9600 bps, 7 bits, None parity and 1 stop bit

9.3 PIN CONFIGURATION



8 PIN DIN PLUG FOR BARCODE SCANNER (BACK VIEW)

PIN	SIGNAL	TE610RN	ZB-800R	Quickscan	PSC Quickscan 6000
2	GND	Black	Yellow	Black	Black
4	RXD	Yellow	Grey	Orange	Blue
5	TXD	Brown	Brown	White	Orange
6	CTS	Grey	White	Blue	Yellow (Not Used)
7	RTS	Green	Green	Yellow	White (Not Used)
8	VCC	Red	Red	Red	Red

9.4 INPUT DATA FORMAT

With Header

Header	Data	CR

Without header (Can scan ID Code only)

Data	CR

9.4.1 3 LINES BARCODE

DC 190 can support 3 Line Barcode (Must be in the Header)

Line 1 :

Space	Header	Data1	CR

Line 2:

Space	Data2	CR

Line3 :

Data3	CR

9.4.2 BARCODE SCANNING MODE:

Below shows the items that can be scan with :

i) OPERATION Mode :

UNIT WEIGHT
TARE WEIGHT
PART CODE
QUANTITY

ii) PROGRAM Mode :

PART CODE
PART NO.
PART NAME
UNIT WEIGHT
TARE WEIGHT
SET POINTS
INVENTORY

iii) JOB SCHEDULE Mode :

PART CODE

9.5 HEADER CODE

The Header Code is used to indicate the type of data that are being scanned. The table below shows the Header Code for different data. Only these Header Codes are accepted for Barcode Scanning.

Header Code	ASCII Code	Data	Header Code	ASCII Code	Data
1	31	Unit Weight	I	49	Total Quantity
2	32	Quantity	K	4B	Inventory
3	33	ID Code	M	4D	Part No
4	34	Tare Weight	N	4E	Part Name
A	41	Gross Weight	Q	51	Set Point 3
E	45	Lot No	X	58	Set Point 4
F	46	Set Point 1 [W]	Y	59	Set Point 5
G	47	Set Point 1 [Q]	O	4F	Set Point 6
H	48	Set Point 2			

9.6 Z COMMAND CODE

The Barcode Scanner can also Scan Command to DC 190 but it must have a Header Z in front.

Header : Z	Command	CR

Z + Command	Function	Z + Command	Function
Z0	Re-Zero	Z8	NET/B/G Key
Z1	Print	Z9	Reprint Label (TNP)
Z2	Unit Weight Clear	ZA	Re-Computing Key (PCS Key)
Z3	Plus	ZS1	Scale 1 (Internal Scale 1)
Z4	Minus	ZS2	Scale 2 (Internal Scale 2)
Z5	Tare	ZS3	Scale 3 (External Scale)
Z6	Clear	ZS4	Scale 4 (Force Balance)
Z7	PLU Key		

9.7 RS232C RELATED SPEC LIST : SPEC 14 to 15

The following SPEC must be set correctly for DC190 to communicate with the Barcode Scanner

SPEC NO	Bit 3	Bit 2	Bit 1	Bit 0
14	**RS232C Connection (Barcode Scanner)** **0 :** No **1 :** Yes	**RS232C Data Length (Barcode Scanner) (Optional)** **0 :** 7 bits **1 :** 8 bits	**RS232 Baud Rate (Barcode Scanner) (Optional)** **0 0 :** 1200 **1 0 :** 4800 **0 1 :** 2400 **1 1 :** 9600	
15	**RS232C Stop Bit (Barcode Scanner) (Optional)** **0 :** 1 bits **1 :** 2 bits	**RS232C with Header (Barcode Scanner)** **0 :** Yes **1 :** No	**RS232C Parity Bit (Barcode Scanner) (Optional)** **0 0 :** No **1 0 :** Not Used **0 1 :** Odd **1 1 :** Even	

Export Default SPEC: SPEC 14: 0010
SPEC 15: 0011

Note:
SPEC14 bit 3 for RS232 Connection is disabled in Default SPEC.
In order to Enable Barcode Code Scanning, this bit must be set to 1.

9.8 BARCODE SAMPLE

The barcode formats is using CODE 39 type. Below are some command and data barcodes for testing purpose. If generate barcode using word processor, please add * before and after the data to indicate the start and end of barcode. If generate by barcode software or barcode printer, it is not necessary as it will generate it own start and end of barcode.

REZERO

Z1

CLEAR

Z6

SCALE 1

ZS1

SCALE 2

ZS2

ID CODE

312345678

PART NAME

NABCDEFGH

10 FORCE BALANCE CONNECTION

DC 190 can support these Force Balances :

Japan Version Only :

SHG 300 (fixed 7 data bits, 1 stop bit and even parity)

Max Capacity	:	310g
Minimum Display	:	0.001g

HR 60

Max Capacity	:	60g
Minimum Display	:	0.1g

HR 200

Max Capacity	:	210g
Minimum Display	:	0.1g

Export Version Only :

Ohaus Explorer 210g

Max Capacity	:	210g
Minimum Display	:	0.001g

10.1 GENERAL SPECIFICATION

Baud Rate	: 4800 / 9600 / 19200 / 38400 bps	(SPEC 8 bit 1 &0)
Data Length	: 7 bits / 8 bits	(SPEC 8 bit 2)
Parity	: None / Odd / Even	(SPEC 9 bit 1 &0)
Stop Bit	: 1 bit / 2 bits	(SPEC 9 bit 3)
Force Balance Type	: Japan / Export -SHG300 / HR200 / HR60 (Japan) -OHAUS EXPLORER (Export)	(SPEC 9 bit 2)
Type of Force Balance (Japan Version Only)	: SHG300 / HR200 / HR60	(SPEC 19 bit 0)

10.2 CALIBRATION OF THE SCALE

SHG300 / HR200 / HR60:

Preparation For SHG300/ HR200 / HR60

1. Perform Initial Setup for the Force Balance according to its Service Manual.
2. Calibrate for SHG is not necessary as it will be done on DC190.
3. Set the Force Balance to Display Masked (RS232 mode).
4. Set the baud rate, data length, parity & stop bit.

Linking to DC190

1. Connect two scales with cable.
2. Select Scale 4 by pressing Scale key several times.
3. Go to calibration mode at DC190 by pressing REZERO +8715 (Span Switch ON)
4. Remove all weight in Force Balance and press Rezero on DC190 and check for HR200 or HR60

For SHG300 and HR200

5. Place 200g on DC190.
6. Enter 200.00 on DC190 and press * key
7. After Calibration, Exit by pressing Mode key.

For HR60

5. Place 60g on DC190.
6. Enter 60.000 on DC190 and press * key
7. After Calibration, Exit by pressing Mode key.

OHAUS EXPLORER :

Preparation For EXPLORER

1. Perform Initial Setup For EXPLORER according to its Service Manual.
2. Set the RS232 setting in EXPLORER.
3. Set Auto Print with Continuously option.
4. Set Numeric Only to Off.
5. Set the Unit to OZ or G.

Linking to DC190

1. Connect two scales with cable.
2. Select Scale 4 by pressing Scale key several times.
3. Calibration is not needed

Note:
1. Re-zero and zero tracking are disabled when using EXPLORER.
   Weight Display in DC 190 will mask.
2. The negative start range for oz mode can up to around –3.00000oz of the capacity.
3. The max tare range for oz mode can up to 7oz.

10.3 FORCE BALANCE SPEC SETTING

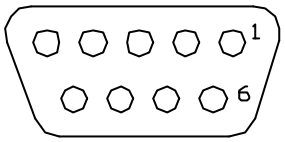
The following SPEC must be set correctly for DC190 to communicate with the Force Balance.

SPEC NO	Bit 3	Bit 2	Bit 1	Bit 0
8	**RS232C Connection (Force Balance)** **0 :** No **1 :** Yes	**RS232C Data Length (PC/Force Balance) (Optional)** **0 :** 7 bits **1 :** 8 bits	**RS232C Baud Rate (PC/Force Balance) (Optional)** **0 0 :** 19200 **1 0 :** 4800 **0 1 :** 38400 **1 1 :** 9600	
9	**RS232C Stop Bit (PC/Force Balance) (Optional)** **0 :** 1 bits **1 :** 2 bits	**Force Balance Type** **0 :** Japan **1 :** Export	**RS232C Parity Bit (PC/Force Balance) (Optional)** **0 0 :** No **1 0 :** Not Used **0 1 :** Odd **1 1 :** Even	
13	**RS232C Header Send (PC) (V2.xx)** **0 :** Code **1 :** Title	**RS232C Connector** **D-Sub** **DIN** **0 0 0** : Printer Force Balance **0 0 1 :** Force Balance Printer **0 1 0 :** Printer PC (*1) **(V2.xx)** **0 1 1 :** PC Printer (*1) **(V2.xx)** **1 0 0 :** PC Force Balance **(V2.xx)** **1 0 1 :** Force Balance PC **(V2.xx)** **1 1 0 - 1 1 1 :** Not Used		
19	**Display "Not F" message for item that is not stored in memory before (V2.xx)** **0 :** Yes **1 :** No	**Link to IMS (For US Version in V2.xx)** **0 :** No **1 :** Yes	**Type of Force Balance (Japan Version Only)** **0 0:** SHG-300 **0 1:** HR-200 **1 0:** HR-60 **1 1:** Not Used	

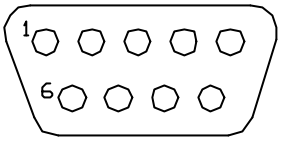
Export Default SPEC:	SPEC 08:	0010
	SPEC 09:	0011
	SPEC 13:	0000
	SPEC 19	0000

Note:
SPEC 08 bit 3 for RS232 Connection is disabled in Default SPEC.
SPEC 13 bit 0, 1 & 2 need to be changed before using the Force Balance.

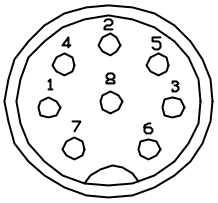
10.4 WIRE CONFIGURATION



9 Pin D-Sub Connector
Back View (Male)



9 Pin D-Sub Connector
Back View (Female)



8 Pin DIN Connector
Back View (Male)

DC 190
8 Pin DIN (Male)

SIGANL	PIN
GND	2
RXD	4
TXD	5
CTS	6

SHG300
8 Pin DIN (Male)

PIN	SIGNAL
2	GND
4	TXD
5	RXD
6	RTS

DC 190
9 Pin D-Sub (Male)

SIGANL	PIN
GND	5
RXD	2
TXD	3
CTS	6

SHG 300
8 Pin DIN (Male)

PIN	SIGNAL
2	GND
4	TXD
5	RXD
6	RTS

DC 190
8 Pin DIN (Male)

SIGANL	PIN
GND	2
RXD	4
TXD	5
CTS	6

Ohaus Explorer 210g
9 Pin D-Sub (Female)

PIN	SIGNAL
7	GND
2	TXD
3	RXD
8	RTS
5	CTS
6	DTR

DC 190
9 Pin D-Sub (Male)

SIGANL	PIN
GND	5
RXD	2
TXD	3
CTS	6

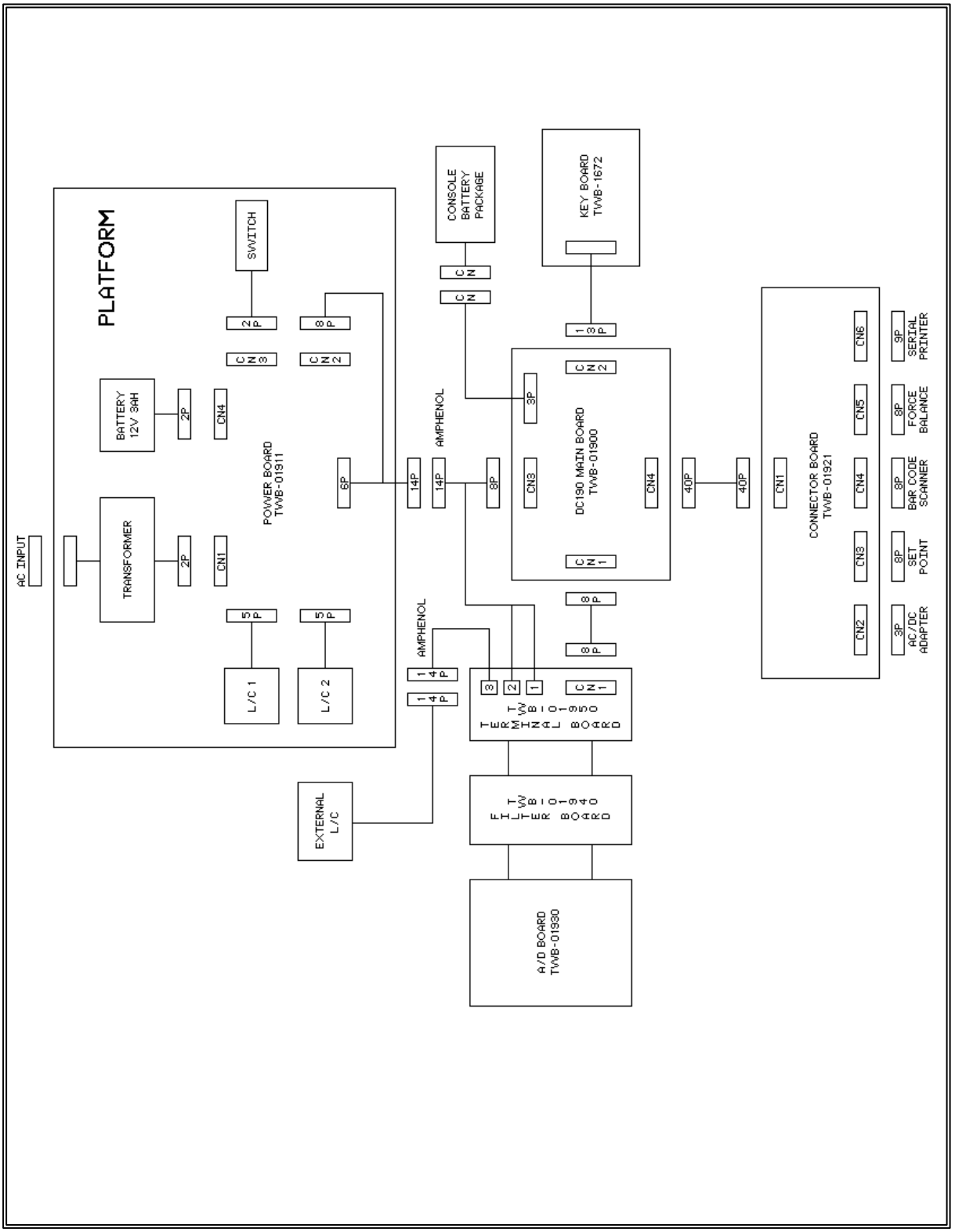
Ohaus Explorer 210g
9 Pin D-Sub (Female)

PIN	SIGNAL
7	GND
2	TXD
3	RXD
8	RTS
5	CTS
6	DTR

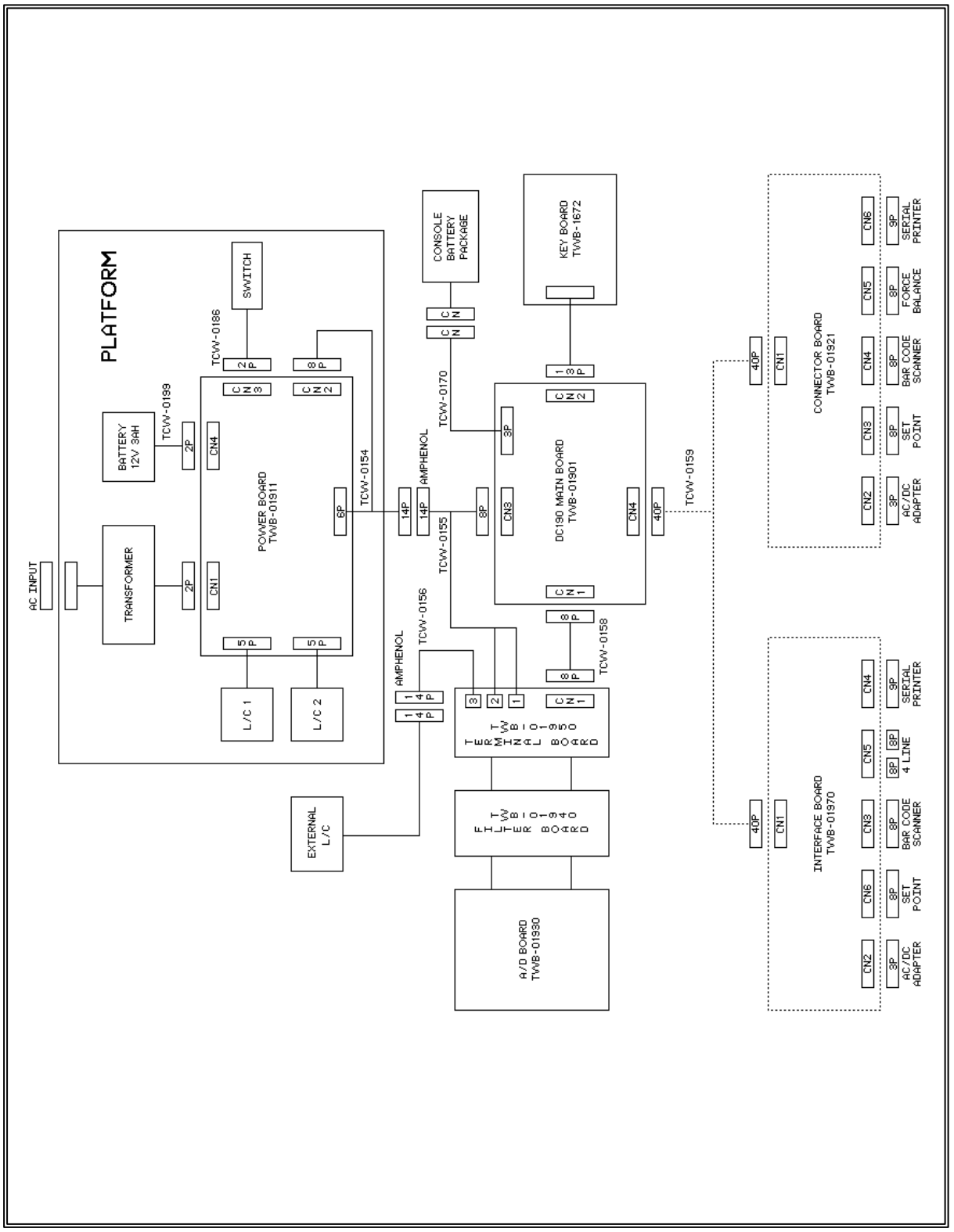
11 CIRCUIT DIAGRAM

11.1 BLOCK DIAGRAM

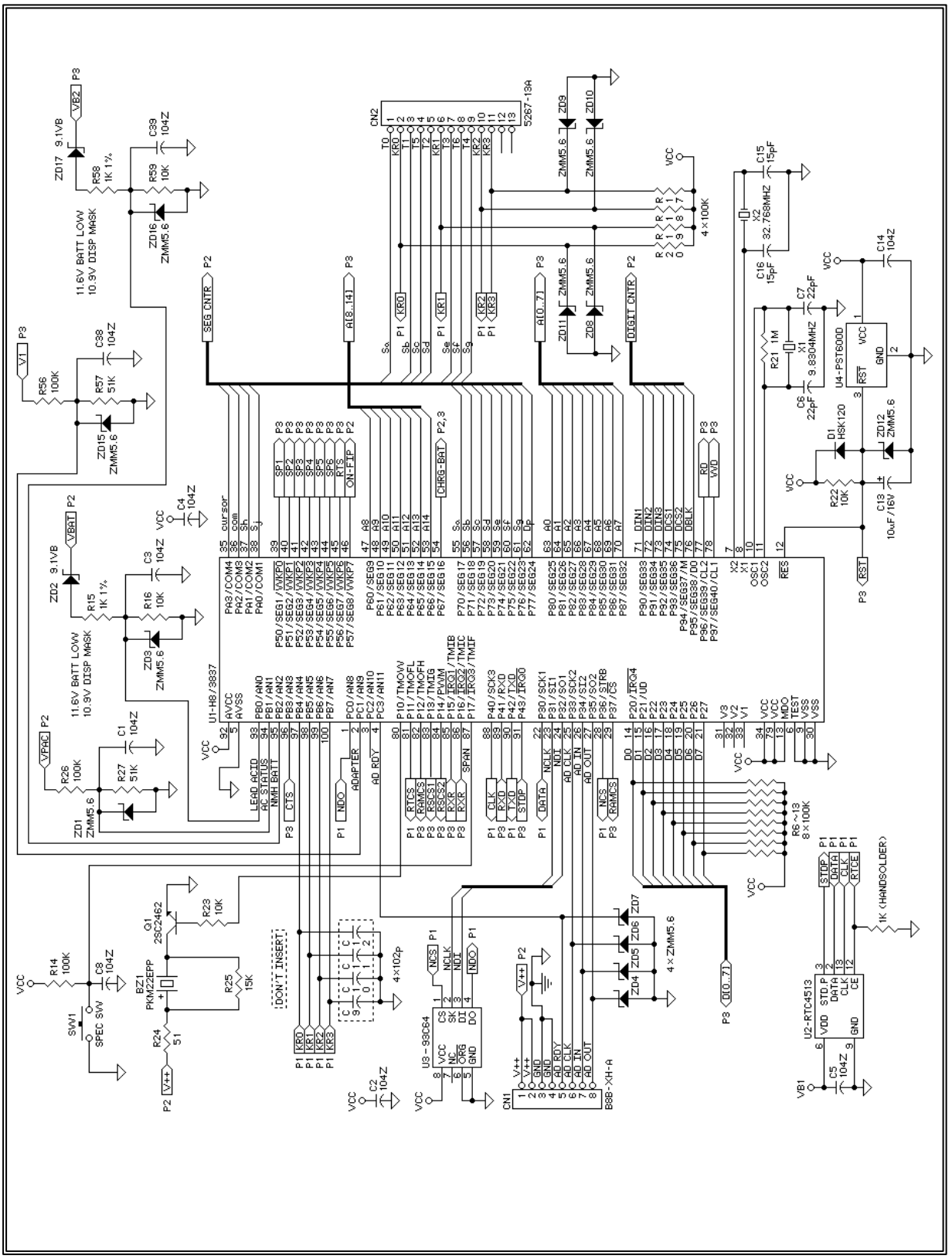
11.1.1 WITH MAINBOARD TWB-01900



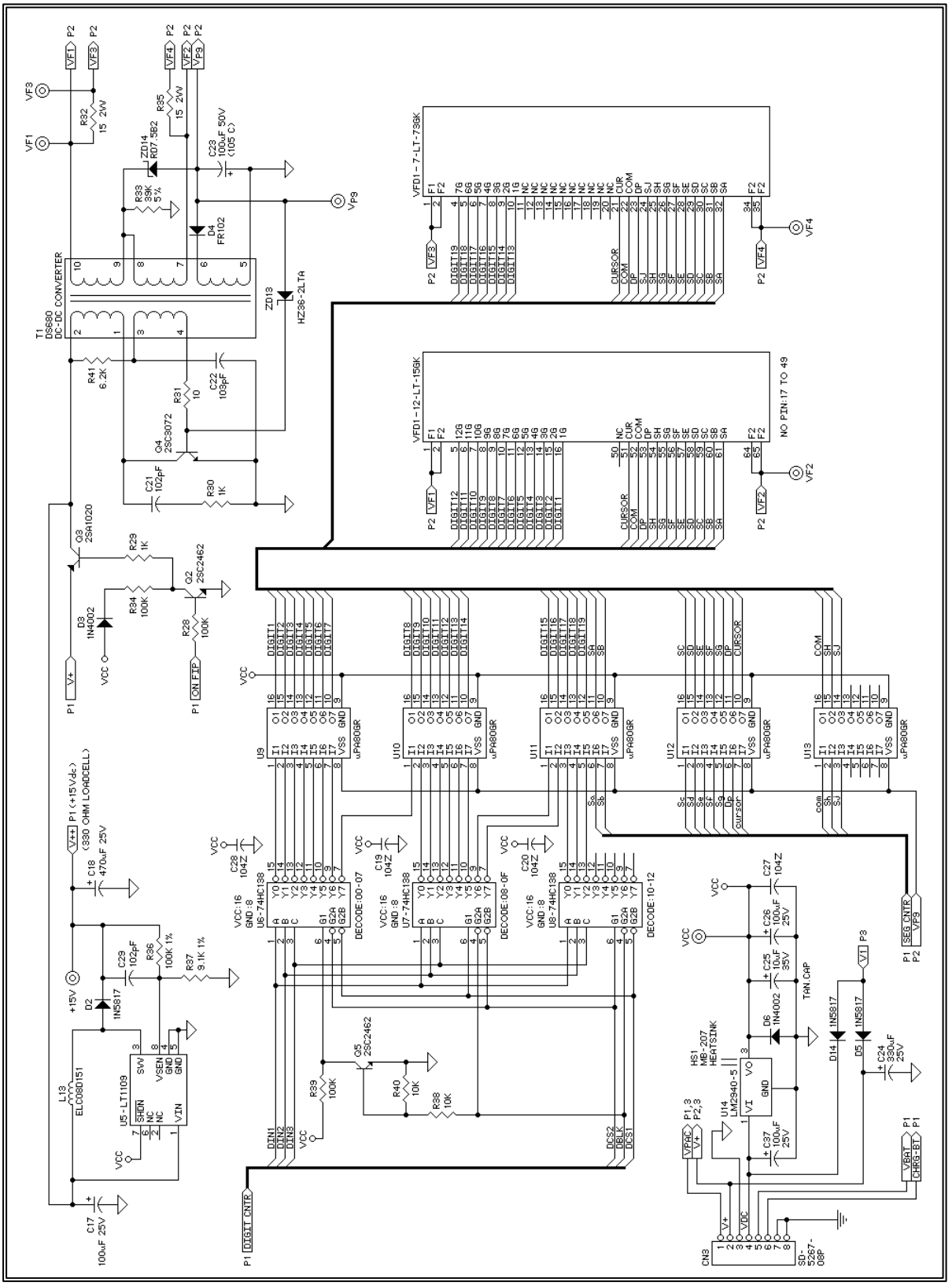
11.1.2 WITH MAINBOARD TWB-01901



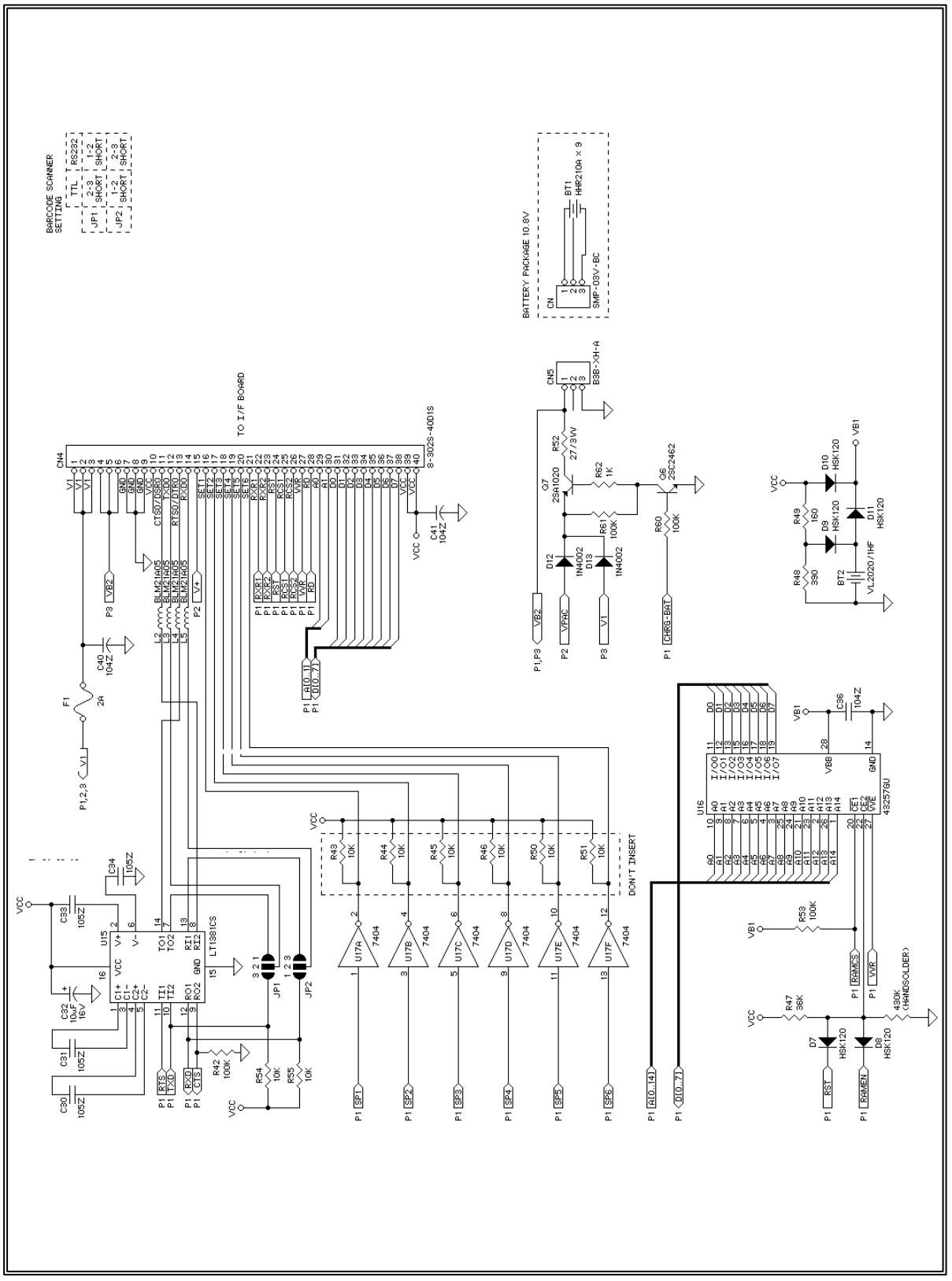
11.2 DC 190 MAIN BOARD TWB-01900-3 (PAGE 1 OF 3)



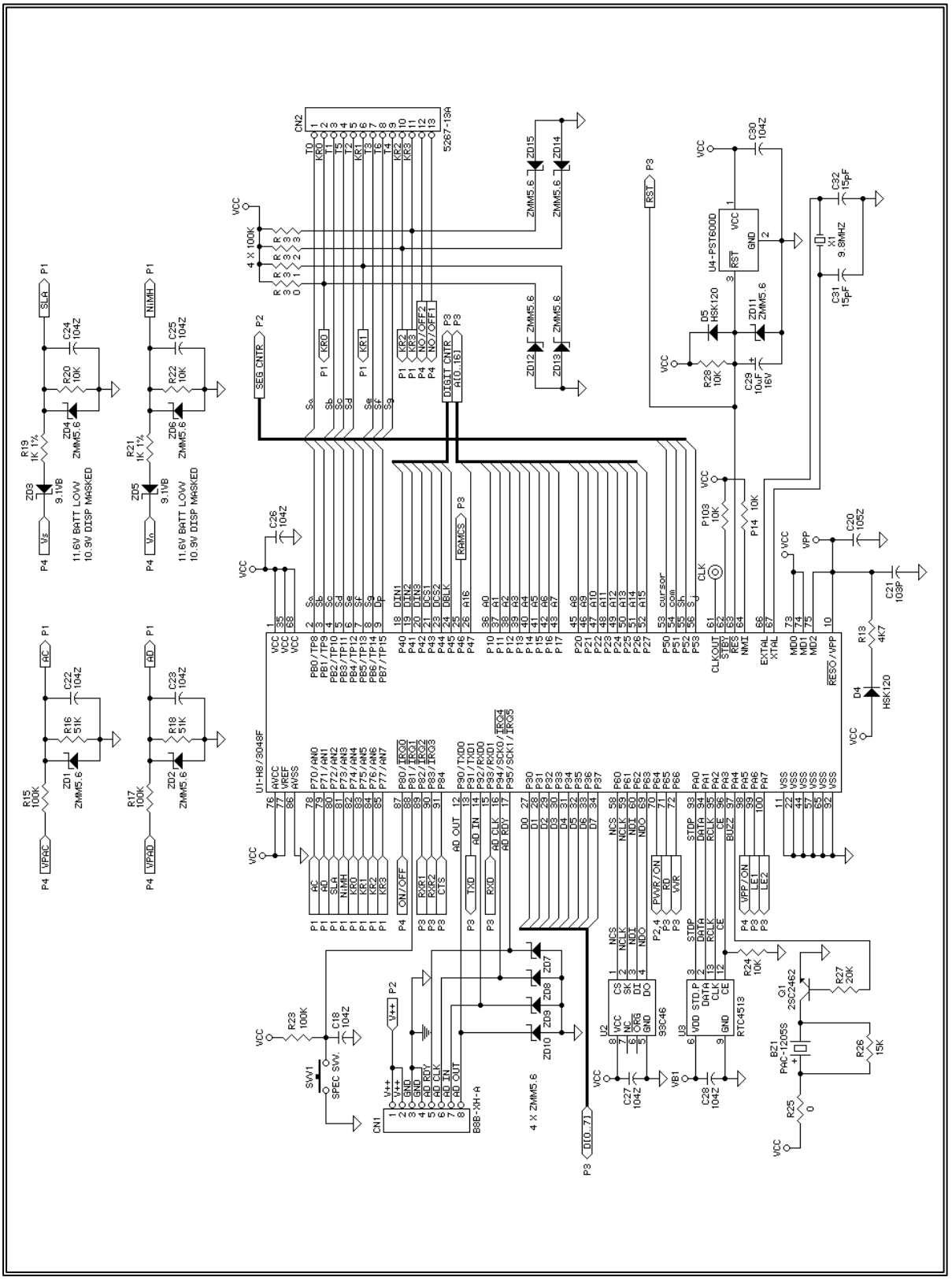
11.2.1 DC 190 MAIN BOARD TWB-01900-3 (PAGE 2 OF 3)



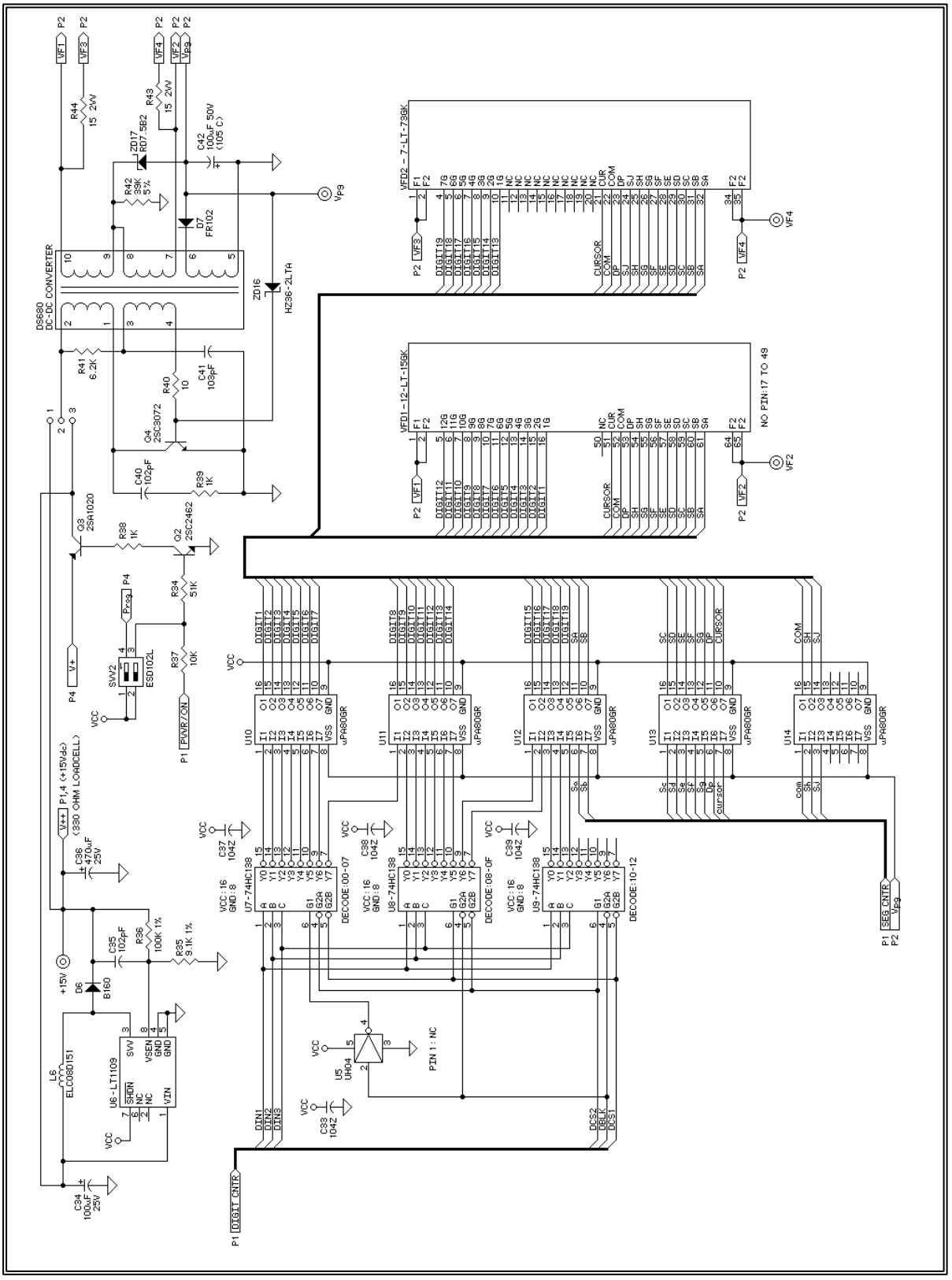
11.2.2 DC 190 MAIN BOARD TWB-01900-3 (PAGE 3 OF 3)



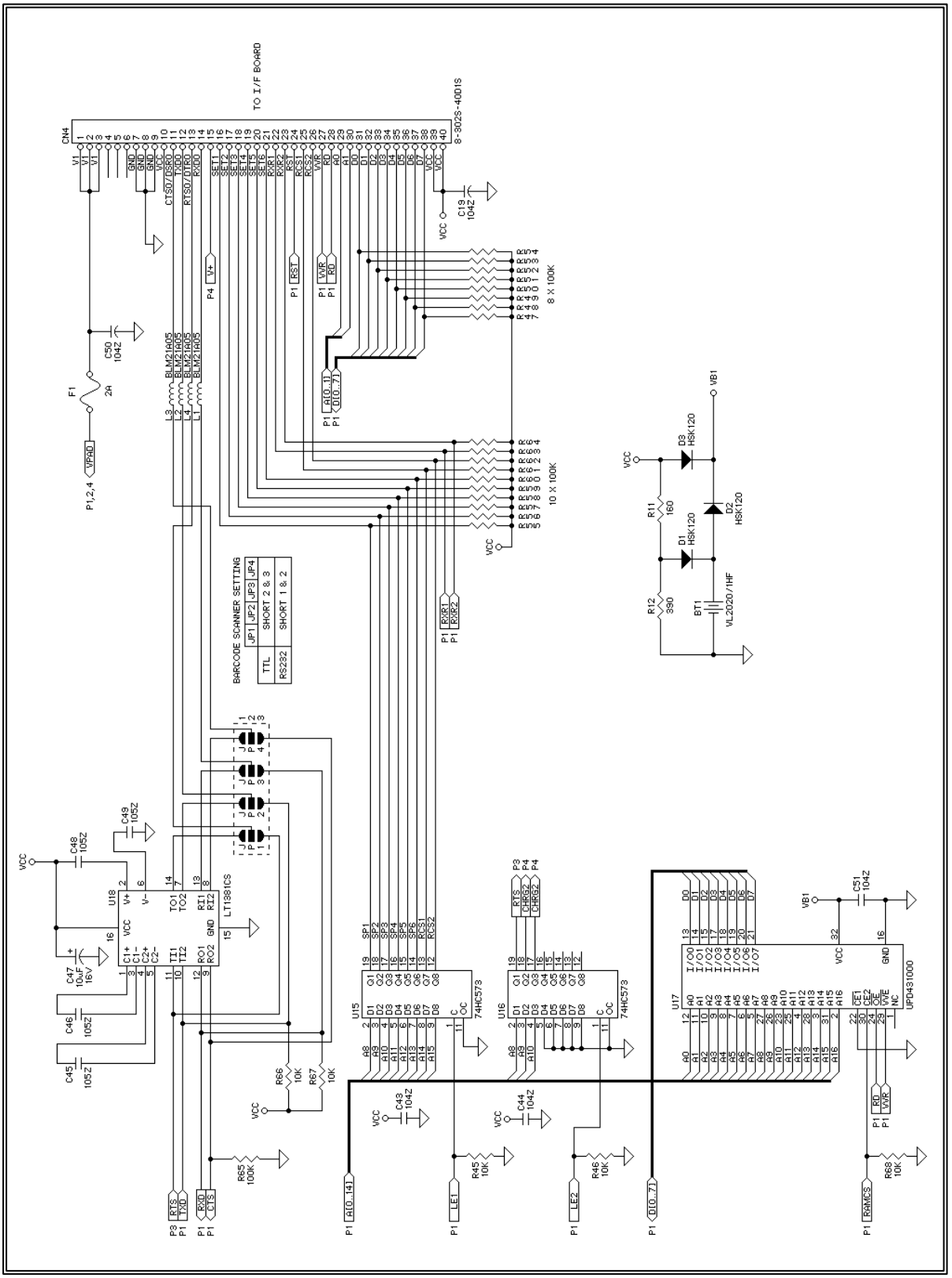
11.3 DC 190 MAIN BOARD TWB-01901-0 (PAGE 1 OF 4)



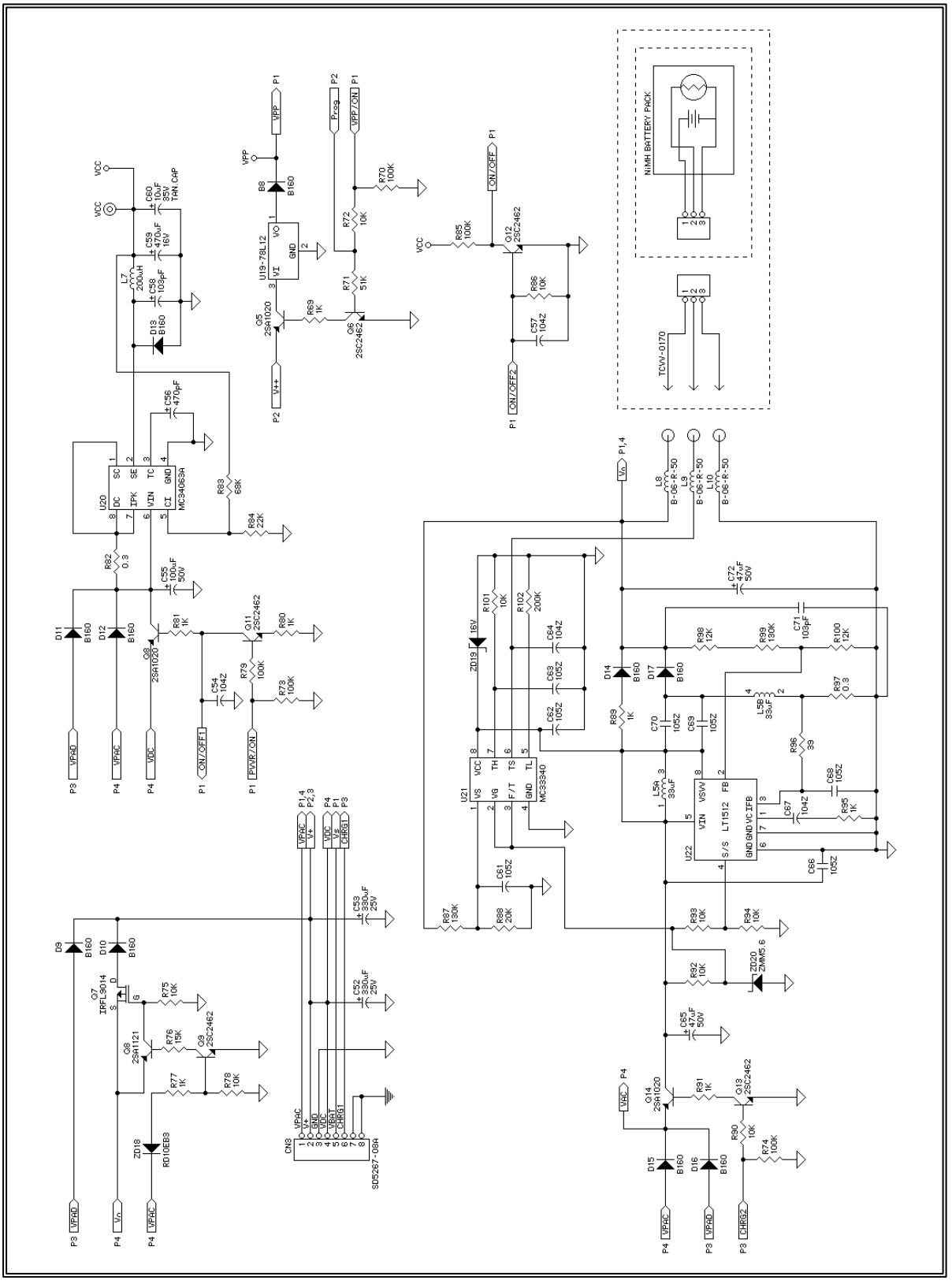
11.3.1 DC 190 MAIN BOARD TWB-01901-0 (PAGE 2 OF 4)



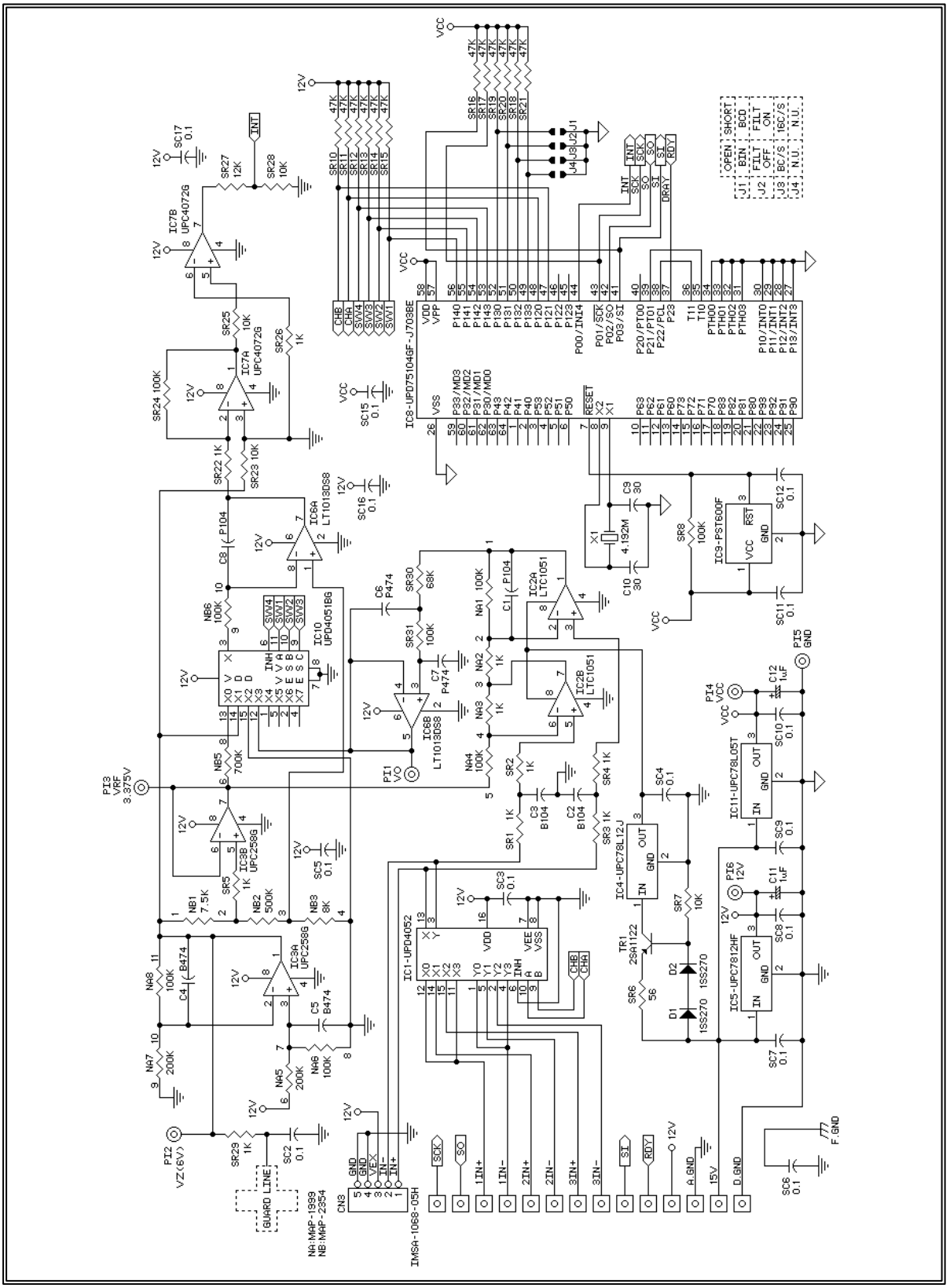
11.3.2 DC 190 MAIN BOARD TWB-01901-0 (PAGE 3 OF 4)



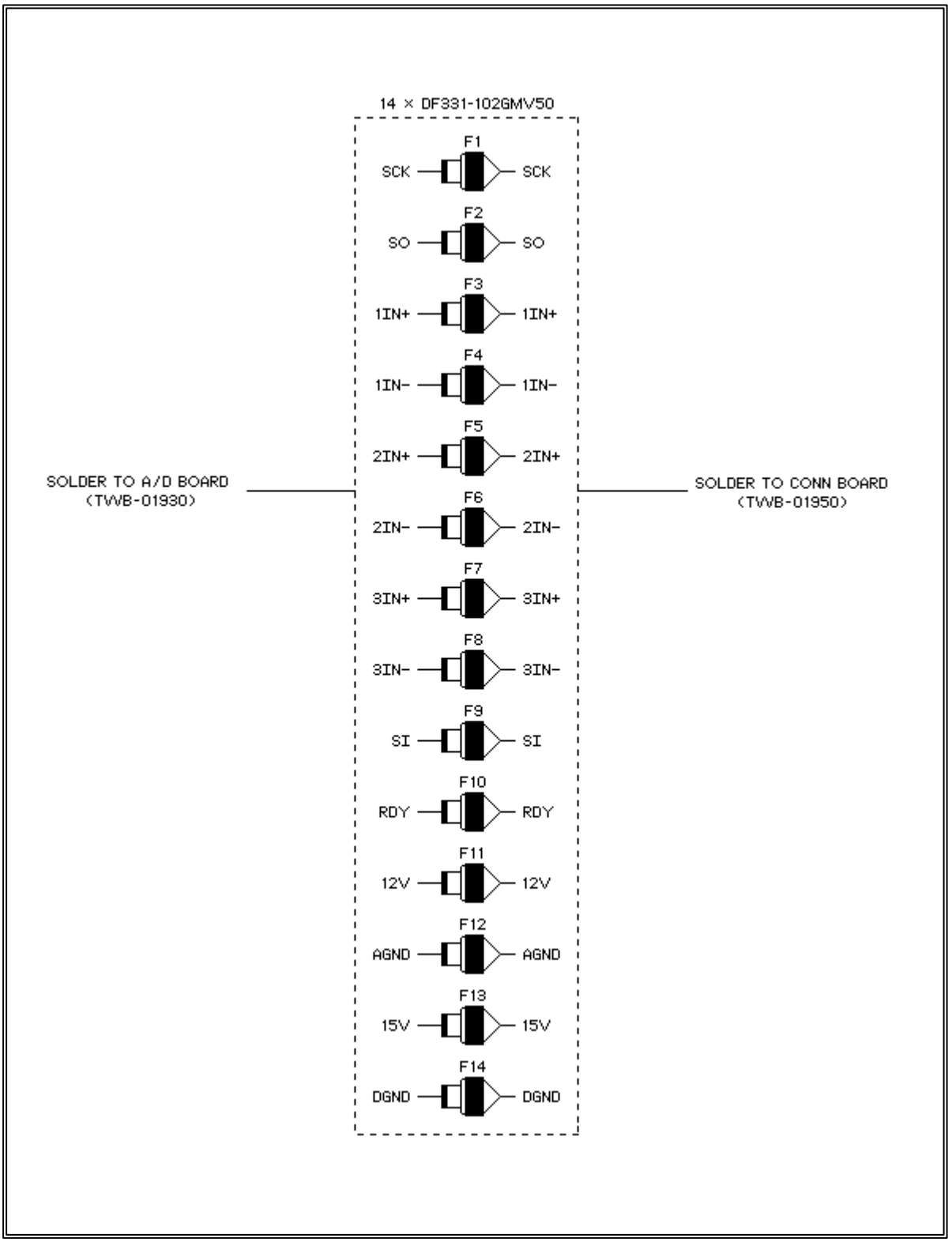
11.3.3 DC 190 MAIN BOARD TWB-01901-0 (PAGE 4 OF 4)



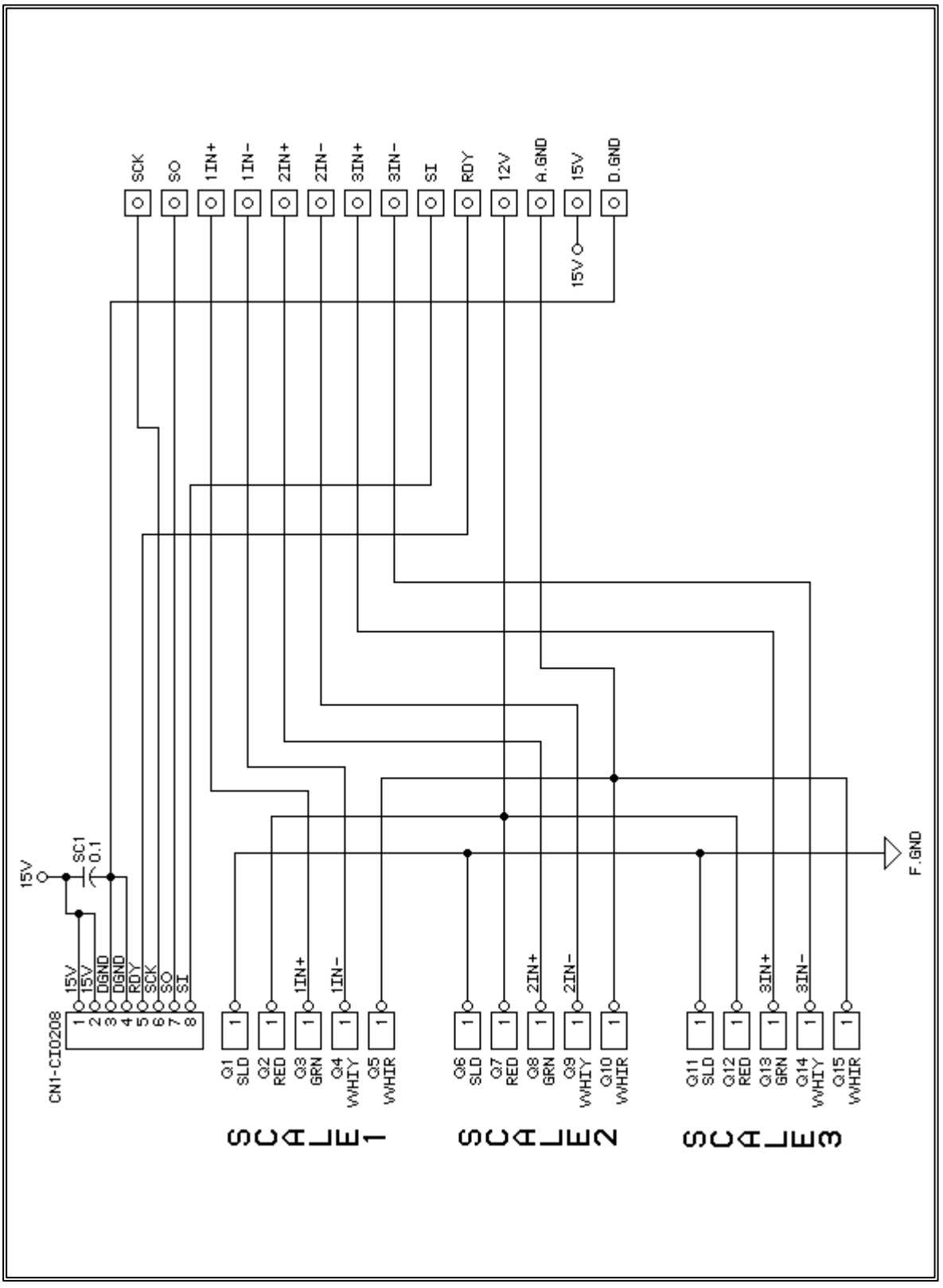
11.4 DC 190 A/D BOARD TWB-01930-1



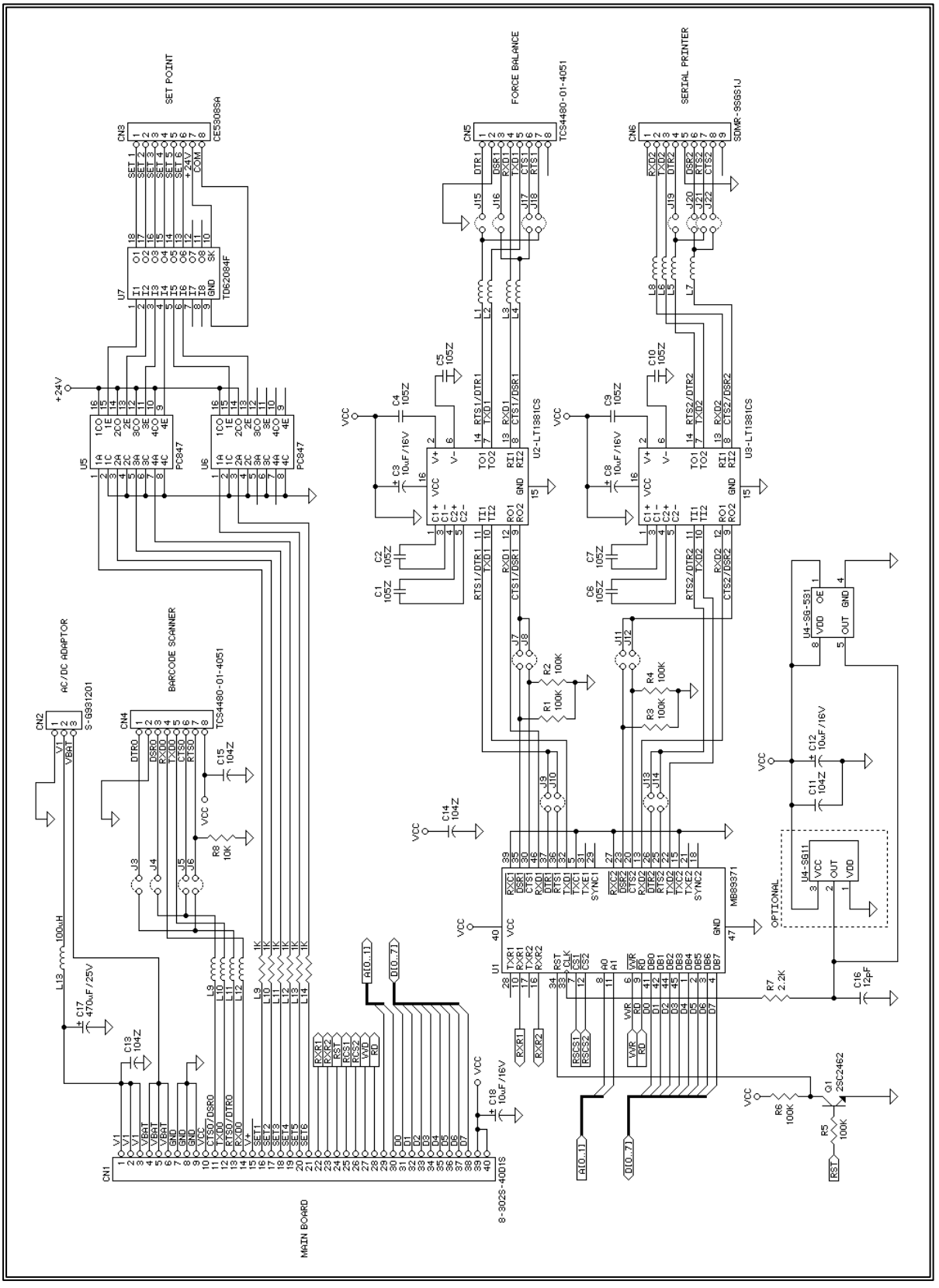
11.5 DC 190 FILTER BOARD TWB-01940-0



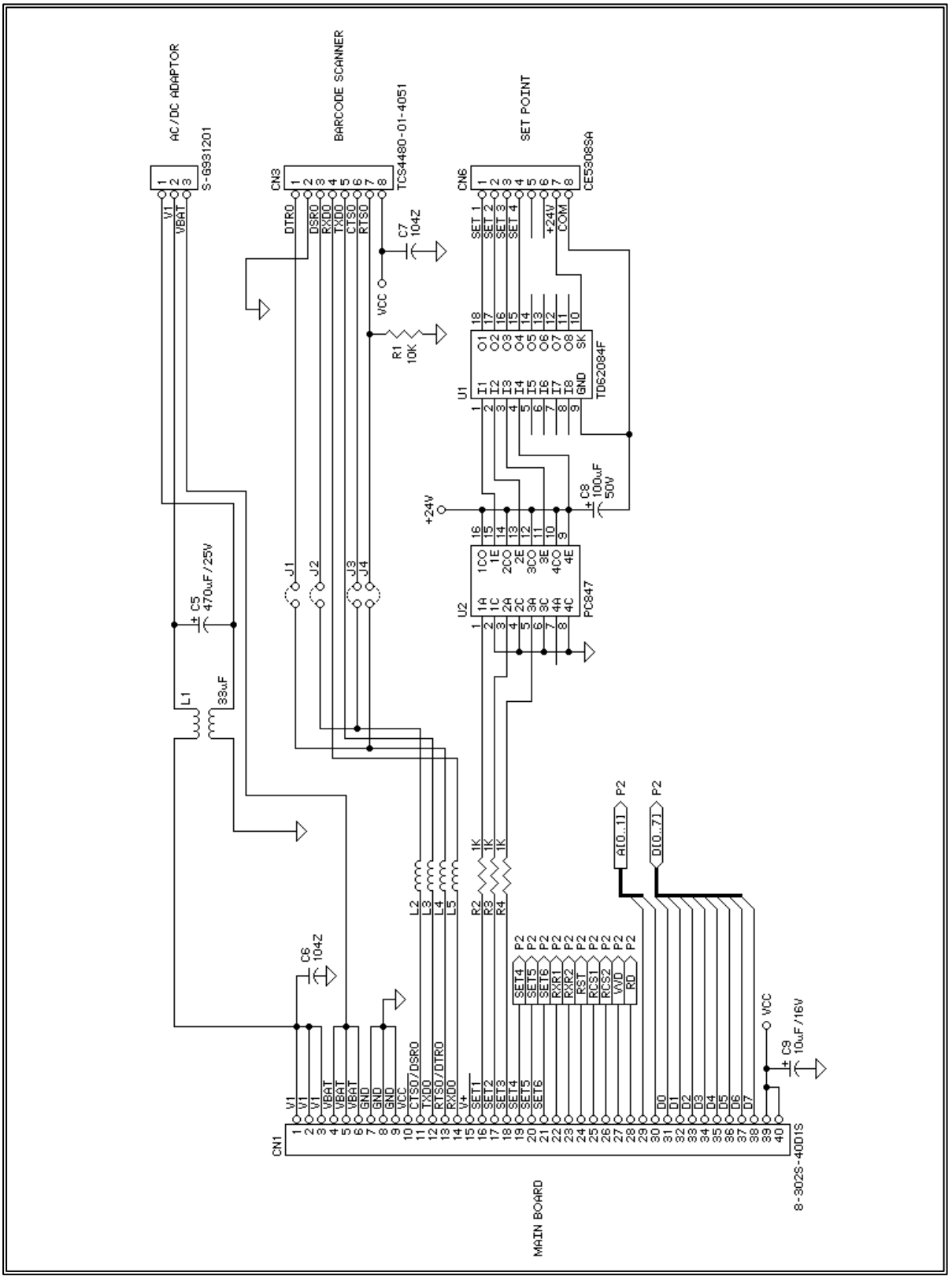
11.6 DC 190 A/D CONNECTOR BOARD TWB-01950-1



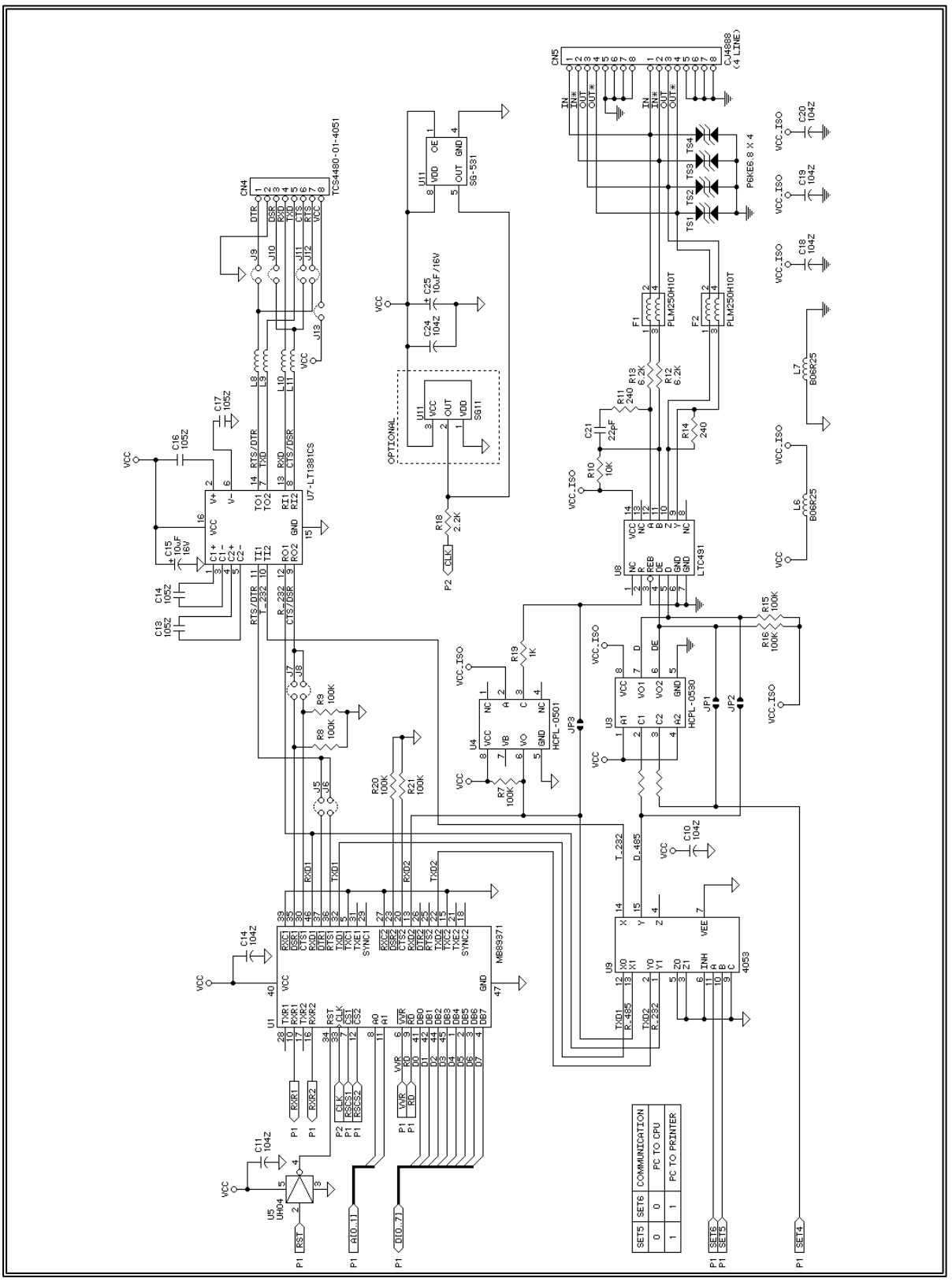
11.7 DC 190 CONNECTOR BOARD TWB-01921-1



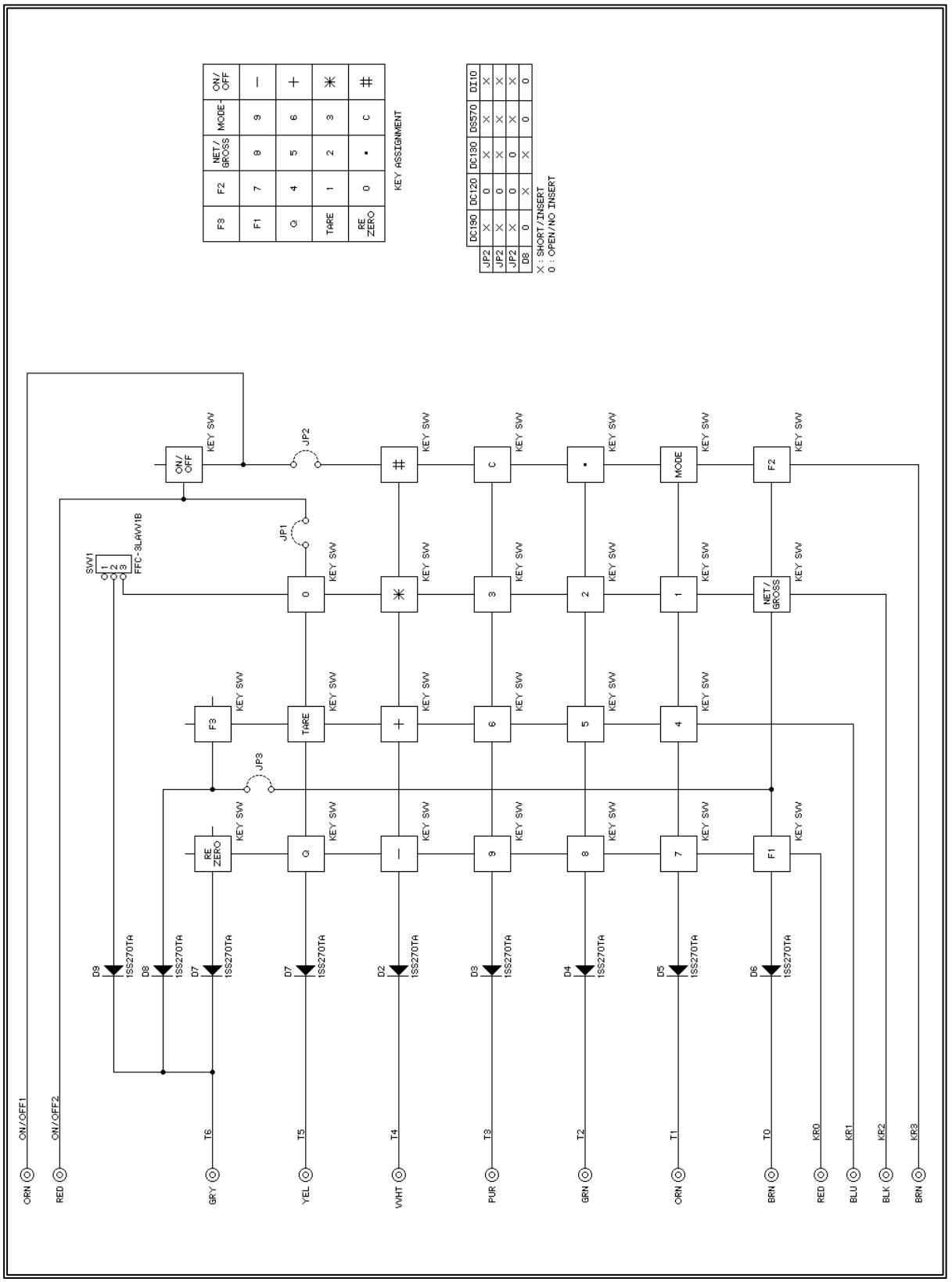
11.8 DC 190 RS232 / 4 LINE INTERFACE BOARD TWB-01970-0 (PAGE 1 OF 2)



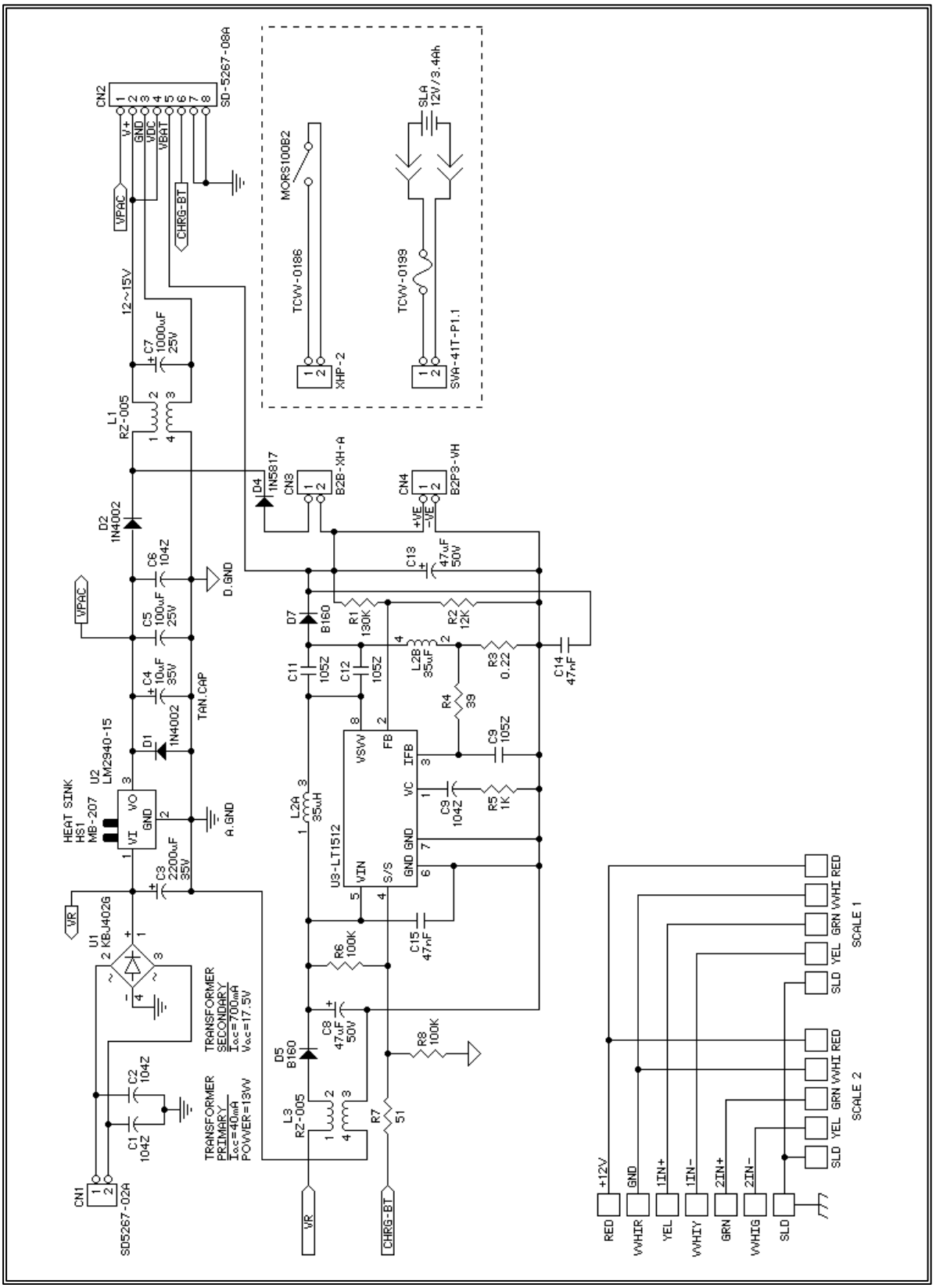
11.8.1 DC 190 RS232 / 4 LINE INTERFACE BOARD TWB-01970-0 (PAGE 2 OF 2)



11.9 DC 190 KEY BOARD TPB-1672-3



11.10 DC 190 POWER BOARD TWB-01911-1



12 APPENDIX A

Teraoka Code	ASCII	Char
00	20	**SP**
01	41	**À**
02	42	**B**
03	43	**C**
04	44	**D**
05	45	**Å**
06	46	**F**
07	47	**G**
08	48	**H**
09	49	**I**
10	4A	**£**
11	4B	**Ê**
12	4C	**L**
13	4D	**Ì**
14	4E	**N**
15	4F	**Î**
16	50	**P**
17	51	**Q**
18	52	**R**
19	53	**S**
20	54	**Ò**
21	55	**U**
22	56	**V**
23	57	**W**
24	58	**X**
25	59	**Y**
26	5A	**Z**
27	2C	**,**
28	2E	**.**
29	2D	**-**
30	30	**0**
31	31	**1**
32	32	**2**
33	33	**3**
34	34	**4**

Teraoka Code	ASCII	Char
35	35	**5**
36	36	**6**
37	37	**7**
38	38	**8**
39	39	**9**
40	40	**@**
41	21	**!**
42	22	**“**
43	23	**#**
44	24	**$**
45	25	**%**
46	26	**&**
47	2F	**/**
48	28	**(**
49	28	**)**
50	27	**‘**
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Teraoka Code	ASCII	Char
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97		
98		
99	0D	**CR**

DC-190 Limited Warranty

Rice Lake Weighing Systems (RLWS) warrants that all RLWS equipment and systems properly installed by a Distributor or Original Equipment Manufacturer (OEM) will operate per written specifications as confirmed by the Distributor/OEM and accepted by RLWS. All systems and components are warranted against defects in materials and workmanship for one year.

RLWS warrants that the equipment sold hereunder will conform to the current written specifications authorized by RLWS. RLWS warrants the equipment against faulty workmanship and defective materials. If any equipment fails to conform to these warranties, RLWS will, at its option, repair or replace such goods returned within the warranty period subject to the following conditions:

- Upon discovery by Buyer of such nonconformity, RLWS will be given prompt written notice with a detailed explanation of the alleged deficiencies.
- Individual electronic components returned to RLWS for warranty purposes must be packaged to prevent electrostatic discharge (ESD) damage in shipment. Packaging requirements are listed in a publication, "Protecting Your Components From Static Damage in Shipment," available from RLWS Equipment Return Department.
- Examination of such equipment by RLWS confirms that the nonconformity actually exists, and was not caused by accident, misuse, neglect, alteration, improper installation, improper repair or improper testing; RLWS shall be the sole judge of all alleged non-conformities.
- Such equipment has not been modified, altered, or changed by any person other than RLWS or its duly authorized repair agents.
- RLWS will have a reasonable time to repair or replace the defective equipment. Buyer is responsible for shipping charges both ways.
- In no event will RLWS be responsible for travel time or on-location repairs, including assembly or disassembly of equipment, nor will RLWS be liable for the cost of any repairs made by others.

THESE WARRANTIES EXCLUDE ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NEITHER RLWS NOR DISTRIBUTOR WILL, IN ANY EVENT, BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

RLWS AND BUYER AGREE THAT RLWS'S SOLE AND EXCLUSIVE LIABILITY HEREUNDER IS LIMITED TO REPAIR OR REPLACEMENT OF SUCH GOODS. IN ACCEPTING THIS WARRANTY, THE BUYER WAIVES ANY AND ALL OTHER CLAIMS TO WARRANTY.

SHOULD THE SELLER BE OTHER THAN RLWS, THE BUYER AGREES TO LOOK ONLY TO THE SELLER FOR WARRANTY CLAIMS.

No terms, conditions, understanding, or agreements purporting to modify the terms of this warranty shall have any legal effect unless made in writing and signed by a corporate officer of RLWS and the Buyer.

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