151

Technical Manual
and
Parts Catalog

INTRODUCTION

This publication is provided solely as a guide for individuals who have received METTLER TOLEDO Technical Training in servicing the METTLER TOLEDO product.

Information regarding METTLER TOLEDO Technical Training may be obtained by writing to:

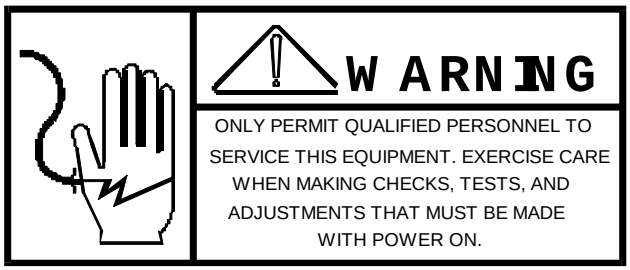
METTLER TOLEDO
Training Center
P.O. Box 1705
Columbus, Ohio 43216
(614) 438-4400

PRECAUTIONS

- **READ** this manual before operating or servicing this equipment.

- **ALWAYS REMOVE POWER** and wait at least 30 seconds **BEFORE** connecting or disconnecting any internal harnesses. Failure to observe these precautions may result in damage to, or destruction of the equipment.

- **ALWAYS** take proper precautions when handling static sensitive devices.



- **DO NOT** connect or disconnect a load cell scale base to the equipment with power connected or damage will result.

- **SAVE** this manual for future reference.

- **DO NOT** allow untrained personnel to operate, clean, inspect, maintain, service, or tamper with this equipment.

- **ALWAYS DISCONNECT** this equipment from the power source before servicing.

- **CALL** METTLER TOLEDO for parts, information, and service.

1. GENERAL DESCRIPTION

The 151 Switching and Summing Module, used with the Model 8132 indicator, provides load cell excitation and signal conditioning for 2 to 6 scales. Each channel of the 151 Module can excite up to 6-350 Ohm or 4-240 Ohm cells. Channel selection is either by the front panel pushbuttons or by a remote control. Automatic Zero Maintenance in the 8132 in inhibited for all channels including summing, and a separate front panel zero adjustment is provided for each channel.

FEATURES

--Local or remote selection of any useable channel.

--Individual zero controls for each channel.

--LED channel and sum indicators.

--Built-in test feature.

--Standard size enclosure, suitable for 19" rack mounting.

--High speed (4800 baud) data output to the 8132 indicator.

--Switch selectable output to a external device at 300 or 4800 baud (20mA current loop ASCII).

--Excitation is provided for 4-420 Ohm or 6-350 Ohm load cells per channel.

--Optional, multiple increment and decimal point capabilities.

2. SYSTEM DESCRIPTION

The 151 module provides 15 volts of excitation for 2 to 6 scales. This excitation voltage is referenced from the 6 scales. This excitation voltage is referenced from the 8132 indicator to provide a "volt per volt" conversion stability and is gated to compensate for zero drift and temperature change. The instrument conditions the temperature change. The instrument conditions the microvolt signal and amplifies it to a analog voltage of from 0 to 10 volts. It is then filtered and channeled into the 8132 indicator where it is converted to a digital signal and displayed.

The initial compensation range permits offsets of from 0 to 30 millivolts for each channel.

The span adjustment range permits full scale inputs of from 3 to 30 millivolts for each channel.

Each used channel, including sum, is provided with an analog zero adjustment located on the front panel. The zero pot located on the front of the 8132 indicator is not used as it will affect the zero on all channels.

The 151 Switching and Summing module consists of four (4) major blocks which follow.:

1). Power Supply - Supplies various voltages for the Main, Analog and LED/Keyboard PCB's.

2). Main PCB - Contains the processing and control logic, it also contains the serial I/O ports.

3). Analog PCB - Each Analog PCB contains a gated power supply, all span and initial controls and provides the analog output to the Main PCB. (A total of 5 analog PCB's may be contained in the 151 module).

4). LED/Keyboard PCB - The keyboard contains 8 low profile keys that allow the operator to select a particular channel, a Summing key and a TEST key.

3. SPECIFICATIONS

3.1 ELECTRICAL AND PHYSICAL

1). Environment

The 151 Module is operable from +14 degrees F (-10°C) to +122°F),(+50°C), 10 to 95% relative humidity, non -condensing.

2). Temperature Coefficients

Zero temperature coefficient is 0.15 microvolts per °C or better over the range of -10 to + 50°C.

Span temperature coefficient is 12 PPM/° C or better over the range of --10 to +50° C.

3). Power Input

The 151 module is operable (upon selection) at 120, 220, and 240 vac, (+10 to-15%), 49 to 61 Hz. Power consumption is less than 25 watts.

4). U.l.. And C.S.A. standards

Materials, components,a nd electrical design are intended to comply with U.L. and C.S.A. standards and requirements, including the grounding of all metal parts, fusing, etc.

5). Appearance and dimension

The color of the model 151 is flat black with green lettering. The enclosure is 13.34 cm tall (5 1/4") x 43.18 cm wide (17") x 21.6 cm deep (8 1/2"), suitable for rack mounting. The Model 151 weighs 9.09 kg (20 lbs.). Power and I/O connections are made via rear mounted connectors.

3.2 INTERNAL FUNCTIONS

The keyboard is mounted on the front of the module. This keyboard gives the operator local control of channel selection. An external keyboard is available (input only), this would give remote operator control of channel selection.

The keyboard consists of four (4) columns of 2 keys each, providing the following 8 functions:

1 to 6: Allows selection of individual channels, either for visual observation, printing or zeroing.

Sum: Sums all used channels and displays the result on the 8132 Digital Indicator.

Test: Pressing and holding the test pushbutton once, will cause all of the display LED's to blank. Pressing and holding the test pushbutton once again will cause all of the display LED's to light up.

3.3 INTERLOCKS

All of the normal 8132 interlocks and features are retained, with the exception of the Automatic Zero Maintenance (AZM), Pushbutton Zero, Tare Interlock and Analog Verification, when the 151 module is used. These functions must be disabled by the internal programming switches located in the 8132 indicator. In addition, the pushbutton and auto tare functions are usable on all selectable channels including the Sum, however tare will be cleared whenever a new channel is selected.

The 151 module permits only one scale or the Sum to be selected at a time. Note that increment size and scale capacity is determined by the 8132 scales, and the total weight applied to all platforms, when in the Sum mode, may not exceed this capacity. A multiple build option is available and, if required, should be purchased with the indicator. When using this option the Sum mode is disabled.

The 151 module does not include analog verification for any scale or the sum.

3.4 DISPLAY FORMAT

The 151 module uses 7 LED's, one for each pushbutton except TEST. Activation of any channel or SUM will light the corresponding LED. This gives the operator a visual check as to which channel is in use.

3.5 DATA INTERFACE

Data interfacing between the 8132 and the 151 is at 4800 baud.

Data output to a printer or external device is transmitted at 300 or 4800 baud, internal program switch selectable, using a 20mA current loop (remote print CTS, RTS and EIA outputs are not available). Printing is inhibited by motion. However, the print command is stored and the data is transmitted when motion ceases.

In order to provide identification of the scale selected in the output data, the 8132 data output signal is routed through the 151 module where a scale identifying character is added. The character A through F are used to identify Scales 1 through 6, respectively, and the character S is used to identify the Sum.

4. INSTALLATION INSTRUCTIONS

4.1 SET-UP PROCEDURE

1). Inspect the 151 module for loose or damaged parts. Open the module and check that all interconnecting harnesses and cables are securely connected.

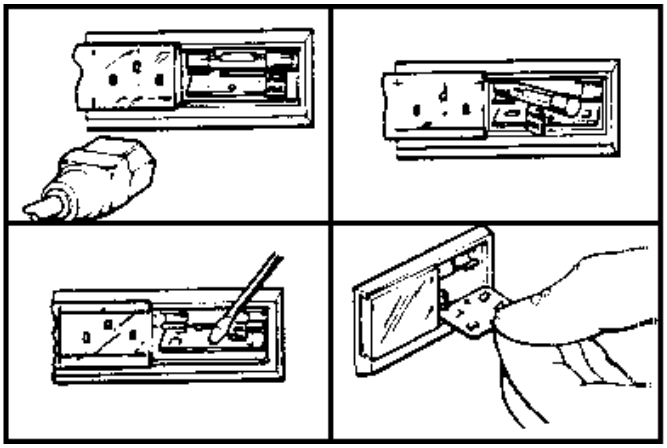
2). Check the AC line filter, voltage selection device for proper voltage selection and fusing.

CAUTION: All U.S. units are shipped for 120 VAC operation. For other than 120 VAC operation, see the following chart.

The following photos will assist you in checking or changing the voltage selection. This step MUST be performed prior to applying power to the unit.

a. This photo shows the line cord detached and the fuse cover moved to the left.

b. In this photo, the fuse is removed by pulling the handle labeled “FUSE PULL”



c. With the fuse removed, use a small screwdriver, or similar object, and voltage, return the card to the slot. The gently pry the card form the assembly. voltage desired will be on the left side of A hole in the card is provided to assist the card in a readable position. In the removal. of the correct back into place.

d. Once yo

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VOLTAGE	REQUIRED	PART
120 VAC	.6 Amp Slo-Blo	095100 00A
220-240 VAC	.3 Amp Slo-Blo	P00570 020

3). At this time install the required accessories to the 8132 indicator. See the following list of instructions for the accessories you have.

1. INSTALLATION INSTRUCTIONS FOR THE 8132 INTERNAL ANALOG HARNESS ONLY.

STEP 1 - WITH POWER REMOVED FROM THE SCALE, disconnect the 8132 zero pot harness (J-8) from the control PCB. Do not reconnect this harness as the zero pot is no longer used. Also remove the zero knob from the front and install the adapter shaft in its place.

STEP 2 - Disconnect the load cell harness (J-2) from the Control PCB and remove the complete load cell assembly from the chassis.

STEP 3 - Remove jumper W5, located on J-10, as this jumper is not required when using the 8132 with a 151 Switching and Summing Module.

STEP 4 - Install the new analog connector onto the chassis in place of the load cell connector and connect harness as shown in Figure 1.

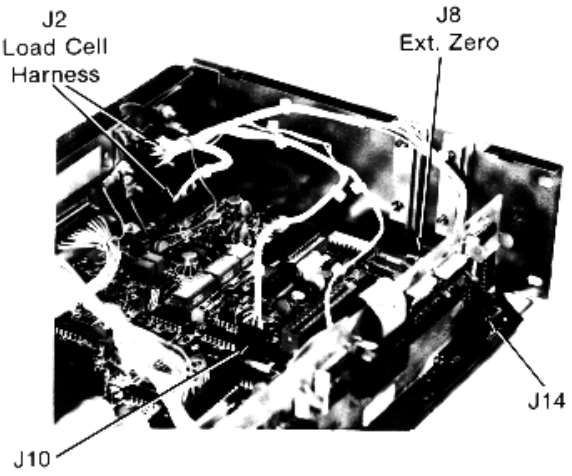


FIGURE 1

2. INSTALLATION INSTRUCTIONS FOR THE 8132 INTERNAL ANALOG HARNESS AND MULTIPLE BUILD OPTION.

STEP 1 - WITH POWER REMOVED FROM THE SCALE, disconnect all harnesses and remove the Control PCB.

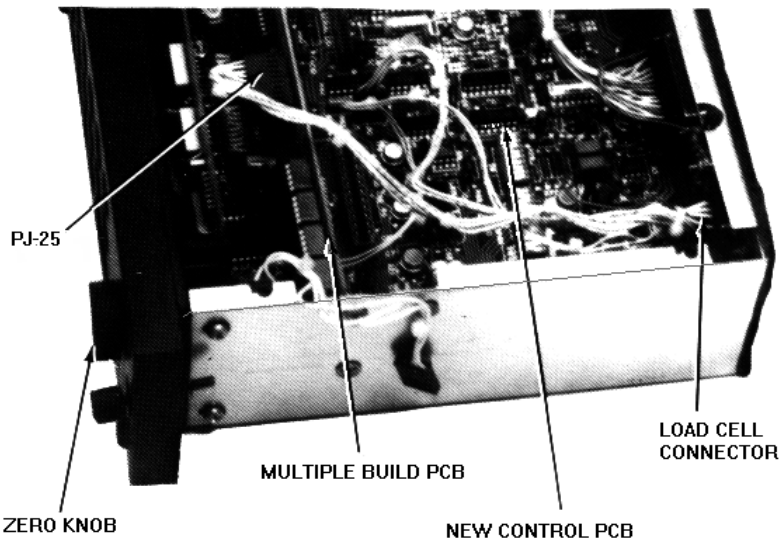
STEP 2 - Remove the complete load cell assembly from the rear of the chassis.

STEP 3 - Install, at this time, the new Control PCB, part number 112078 00A. When using the multiple build option this Control PCB must be used.

STEP 4 - Install the new analog connector in place of the load cell connector.

STEP 5 - Install the multiple build PCB into P-7.

STEP 6 - Reconnect all harnesses with the exception of the front panel zero pot (J-8), as this pot is no longer used. See Figure 2.



STEP 7 - Remove the zero knob from the front of the 8132 and place the adapter shaft in its place.

3. INSTALLATION INSTRUCTIONS FOR ADDING THE MULTIPLE BUILD OPTION TO AN EXISTING INSTALLATION.

STEP 1 - REMOVE POWER FROM SYSTEM and gain access to the Control PCB by removing the cover assembly.

STEP 2 - Disconnect all harnesses connected to the Control PCB and remove the Control PCB.

STEP 3 - Install the next Control PCB, part number 112078 00A. When using the multiple build option, this Control PCB must be used.

STEP 4 - Reconnect all harnesses.

STEP 5- Install the multiple build PCB (part number 112064 00A) into P-7 of the new Control PCB, and connect the P25 of the analog harness to J-1 of the multiple build PCB. See Figure 3.

STEP 6 - Set all programming switches to the desired position. (See Section 4.2).

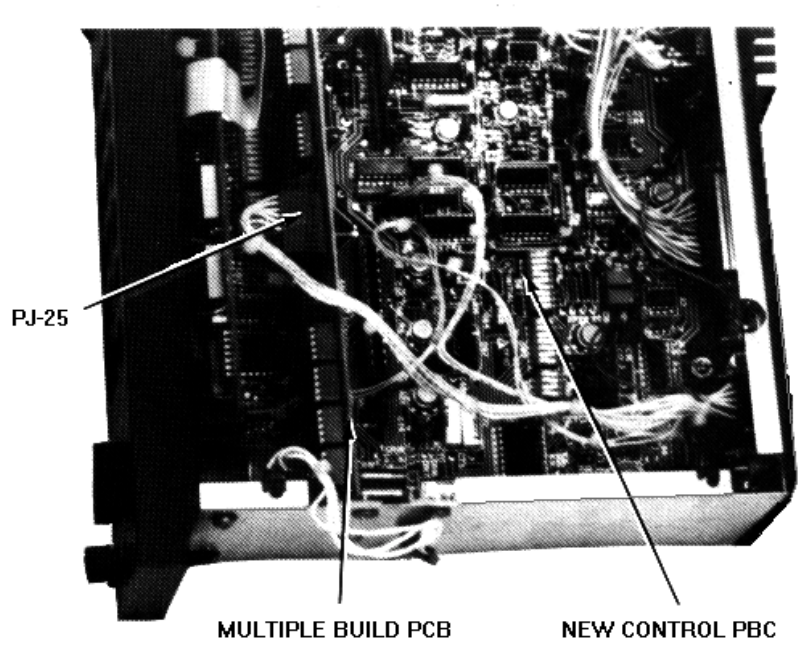


Figure 3

STEP 7 - Apply power and check units for proper operation.

4. If required, add additional Analog PCB's load cell harnesses and zero potentiometer assemblies, at this time. One analog K.O.P. must be added for each additional platform installed.

5. Set all programming switches for the desired operation. See Section 4.2.

6. Preliminary Calculations

   Before any calibration is done it should be determined if the load cell(s) are of a size that will work correctly with the indicator and platform. If it is a standard build, go ahead and install the scale. However, if it is a special build or a conversion of an existing mechanical scale, care should be taken to insure a suitable microvolt per increment build.

NOTE: All microvolt per increment builds are limited by the 8132 digital indicator on a per channel basis. Refer to th

7. Calibrate each used channel.

Press the channel select key corresponding to the channel to be calibrated and proceed with calibration. Refer to the 8132 Technical Manual for this procedure.

NOTE: Channel one is calibrated by using the initial and span switches located on the 8132 Main Control PCB. Channels 2 through 6 use the initial and span switches located on the corresponding Analog PCB.

After all used channels are calibrated and on zero, press the Sum key and adjust to zero by using the Sum zero potentiometer.

8. When all channels, including sum, are on zero add test weights to two or more platforms. With the 151 in the sum mode the indication should read the total weight applied to all platform. A minor adjustment, to the sum reading, is possible by using R-64. See Figure 4.

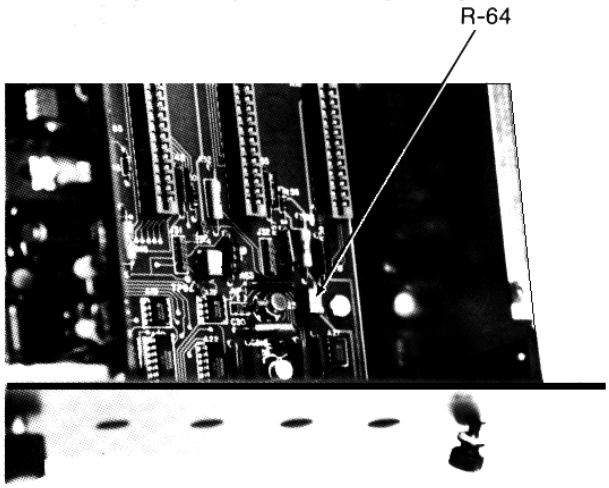


Figure 4

4.2 PROGRAM SWITCH SUMMARY

It is important that you refer to the Technical Manual of the printer used, for program switch setting that may affect the printer operation.

NOTE 1: When installing any Toledo Scale printer, the printer must be set-up to work with an 8132 indicator.

NOTE 2: The following switches in the 8132 must be as shown for proper operation.

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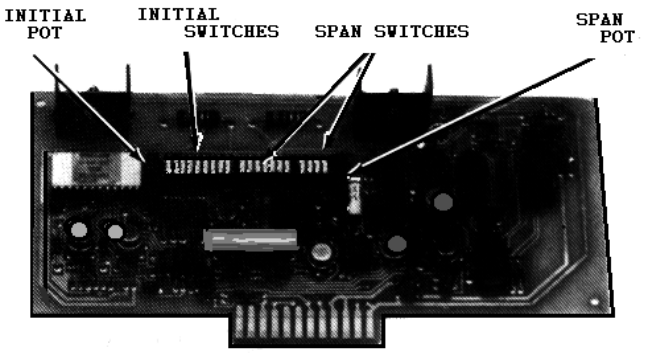
SW5-7	ON	Tare Interlock
SW6-4	OFF	Analog Verify
SW6-6	OFF	Expand
SW7-1	ON	Auto Zero Maintenance
SW7-2	OFF	Checksum
SW7-6	ON	Baud Rate

All other program switches should be set as required for each installation.

ANALOG PCB SWITCH SUMMARY



NOTE: Turning ON any of the initial switches will increase the initial compensation.

TURNING ON ANY OF SW1 INITIAL SWITCHES WILL INCREASE THE INITIAL COMPENSATION.

SW 1-2 HAS 1/2 THE EFFECT OF SW1-1.

SW1-3 HAS 1/2 THE EFFECT OF SW1-2 AND SO ON DOWN TO SW1-8.

SW1 -- INITIAL

SW1-1 --- LARGEST STEP
SW1-2 ---
SW1-3 ---
SW1-4 ---
SW1-5 ---
SW1-6 ---
SW1-7 ---
SW1-8 --- SMALLEST STEP
SW1-9 --- NOT USED

SW2 AND 3 -- SPAN

SW2-1 --- LARGEST STEP
SW2-2 ---
SW2-3 ---
SW2-4 ---
SW2-5 ---
SW2-6 ---
SW2-7 ---
SW3-1 ---
SW3-2 ---
SW3-3 ---
SW3-4 --- SMALLEST STEP

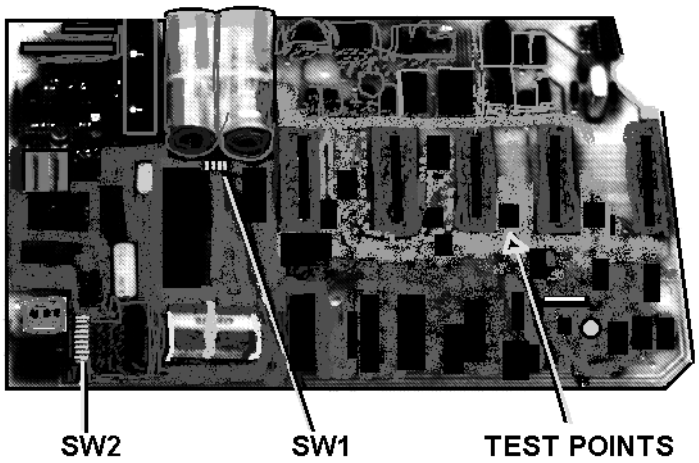
NOTE: Tuning OFF any of the span switches will increase the weight indication.

TURNING OFF ANY OF THE SW2 AND SW3 SPAN SWITCHES WILL INCREASE THE WEIGHT INDICATION.

SW2-2 HAS 1/2 THE EFFECT OF SW2-1.

SW2-3 HAS 1/2 THE EFFECT OF SW2-2 AND SO ON THROUGH SW3-4.

MAIN SCALE PCB SWITCH SUMMARY



SW1-1 OUTPUT BAUD RATE

ON- 4800 Baud Rate
OFF- 300 Baud Rate

SW1-2 MULTIPLE BUILD OPTION
(WITH THIS OPTION INSTALLED, THE SUM MODE IS DISABLED).

ON- More than one increment size is used.
OFF- All scales have the same increment size.

NOTE: This switch may only be ON when the 8132 has the multiple build option installed.

SW1-3 PRINT t FOR TONS

On- A lower case "**t**" is printed in place of the LB or KG.
OFF- The LB or KG symbols are printed.

SW1-4 SUM MODE ONLY

ON- Only the sum of all scales used will be displayed.
OFF- All used channels and sum may be displayed.

SW2-1 PRINT GROSS, TARE, NET

ON- The printer will print the Gross, Tare, and Net Weight Information.
OFF- Only the displayed weight is printed.
(Gross or Net - Not Tare).

SW2-2
SW2-3 **-- MINIMUM PRINT**

The setting of SW2-2 and SW2-3 control the minimum number of graduations that can be printed.

SW2-2	**SW2-3**	
OFF	OFF	NONE
OFF	ON	10 increment
ON	OFF	20 increment
ON	ON	50 increment

SW2-4 DOUBLE WIDTH PRINTING

ON - All information is printed at double width.
OFF - All printed fields are single width.

SW2-5 CHECKSUM

ON - A checksum digit is transmitted with the output data.
OFF - A checksum digit is not transmitted.

SW2-6 ID PRINT

ON - A channel identification character is added to the outputed data.
OFF - No identification character is added.

SW2-7 NEGATIVE WEIGH PRINTING

ON - Below "0" weights may be printed.
OFF - The printer will not print as long as the indication is below "0".

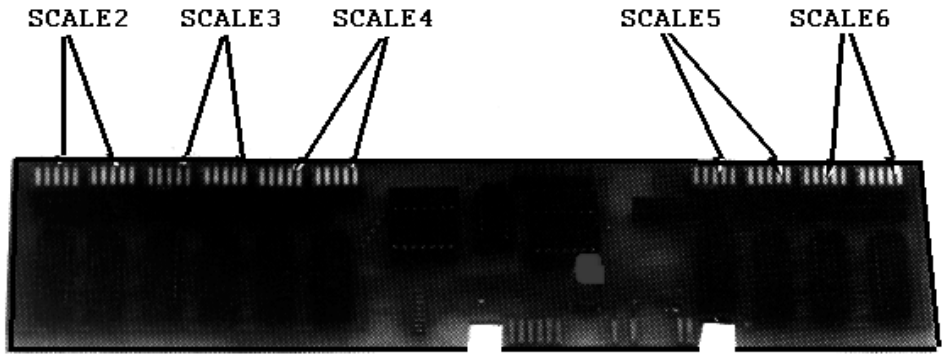
SW2-8 MULTIPLE LINE PRINTING

ON - The printer will print multiple lines.
OFF - Single line print only.

SW2-9 NOT USED.

Should be OFF.

MULTIPLE BUILD PCB SWITCH SUMMARY



The ten switches located on the Multiple Build PCB are divided into 5 groups, with each group consisting of 2 banks of switches. The first bank in each group is used to select the Total Increment Count. The second bank to select the Increment Size and Decimal Point Location. Refer to the following chart for the correct switch settings of each scale installed.

NOTE: WITH THE MULTIPLE BUILD OPTION INSTALLED THE SUM MODE WILL NOT OPERATE.

SCALE NUMBER	SWITCH NUMBER	SWITCH DESCRIPTION

1	All switches for scale # 1 are located in the 8132. Refer to the 8132 Technical Manual for the proper switch settings.	
2	SW1- 1 thru 5 SW2- 1 & 2 SW2- 3, 4 & 5	Total increment Count Increment Size Decimal Point Selection
3	SW3- 1 thru 5 SW4- 1 & 2 SW4- 3, 4 & 5	Total Increment Count Increment Size Decimal Point Selection
4	SW5- 1 thru 5 SW6- 1 & 2 SW6- 3, 4 & 5	Total Increment Count Increment Size Decimal Point Selection
5	SW7- 1 thru 5 SW8- 1 & 2 SW8- 3, 4 & 5	Total Increment Count Increment Size Decimal Point Selection
6	SW9 - 1 thru 5 SW 10- 1 & 2 SW10- 3, 4 & 5	Total Increment Count Increment Size Decimal Point Selection

SW 1,3, 5,7,9 - 1 thru 5 TOTAL INCREMENT COUNT

NUMBER OF INCREMENTS	**--1**	**--2**	**--3**	**--4**	**--5**
1000	OFF	OFF	OFF	OFF	OFF
1500	OFF	OFF	OFF	OFF	ON
1700	OFF	OFF	OFF	ON	OFF
2000	OFF	OFF	OFF	ON	ON
2500	OFF	OFF	ON	OFF	OFF
3000	OFF	OFF	ON	OFF	ON
3400	OFF	OFF	ON	ON	OFF
4000	OFF	OFF	ON	ON	ON
5000	OFF	ON	OFF	OFF	OFF
6000	OFF	ON	OFF	OFF	ON
6800	OFF	ON	OFF	ON	OFF
8000	OFF	ON	OFF	ON	ON
8500	OFF	ON	ON	OFF	OFF
10000	OFF	ON	ON	OFF	ON
12000	OFF	ON	ON	ON	OFF
16000	OFF	ON	ON	ON	ON
17000	ON	OFF	OFF	OFF	OFF
20000	ON	OFF	OFF	OFF	ON

SW2,4,6,9,10 - 1 & 2 INCREMENT SIZE

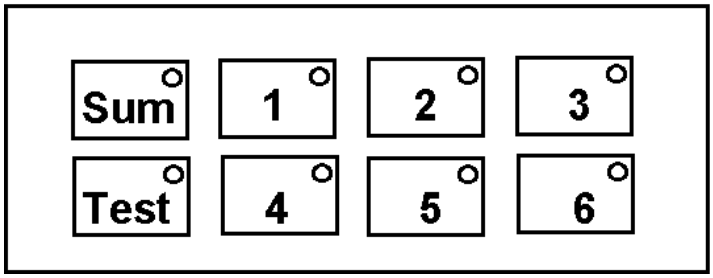
LB.	**KG.**	**--1**	**--2**
X1	X0.5	OFF	ON
X2	X1	ON	OFF
X5	X2	ON	ON

SW2,4,6,8,10 - 3,4 &5 DECIMAL POINT SELECTION

LB. KG. X5 X2 X2 X1 X1	KG. X5	--3	--4	--5
XXXX00	XXXXX0	OFF	OFF	OFF
XXXXX0	XXXXXX	OFF	OFF	ON
XXXXXX	XXXXX.X	OFF	ON	OFF
XXXXX.X	XXXX.XX	OFF	ON	ON
XXXX.XX	XXX.XXX	ON	OFF	OFF
XXX.XXX	XX.XXXX	ON	OFF	ON
XX.XXXX	X.XXXXX	ON	ON	OFF
X.XXXXX	-- -- --	ON	ON	ON

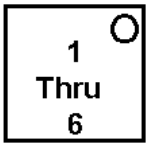
5. OPERATION INSTRUCTIONS

OPERATORS PANEL

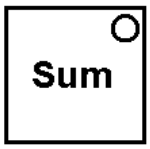


OPERATOR PANEL DESCRIPTION

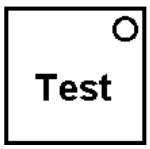
1 Through 6



Used to select and display the channel which is being used.



Used to select the summing operation, which is the display of the total weight applied to all used channels 1 through 6.



Pressing ad holding the test display LED's to blank. Pressing and holding the test pushbutton once again will cause all of the display LED's to light up.

6. PREVENTATIVE MAINTENANCE

The Model 151 Switching and Summing Module is designed to require a minimum of maintenance and service. This section provides instructions and procedures for maintaining the Model 151, as well as a troubleshooting guide to aid in problem analysis.

6.1 REQUIRED TOOLS AND SUPPLIES

The following items are recommended for proper maintenance and repairs. Common hand tools are also required.

Volt-Ohm Meter
Load Cell Simulator (Part #085547 020)
Cleaning Cloth
"Velostat" Static Bags

6.2 MAINTENANCE SCHEDULE

The frequency at which normal maintenance (cleaning and inspection) should be performed, when installed in a clean office environment, should be once a year. However, if the unit is subjected to a dusty or a dirty environment the frequency should be increased as required.

6.3 CLEANING

Clean the keyboard and covers with a soft clean cloth that has been dampened with a mild window type cleaner. (DO NOT USE ANY TYPE OF INDUSTRIAL SOLVENT) DO NO SPRAY CLEANER DIRECTLY ONTO THE UNIT.

6.4 INSPECTION

Inspect the module for any loose connections, loose or missing screws, and any visual defects.

6.5 TROUBLESHOOTING

1). If operational difficulties are encountered, obtain as much information as possible regarding the particular trouble, as this may eliminate a lengthy, detailed checkout procedure.

2). Check fuses, primary power lines, external circuit elements and related wiring for possible defects. Failures and malfunctions often may be traced to simple causes such as loose or improper circuits, power supply connections to fuse failure.

3). Use the electrical interconnecting diagram as an aid to locating trouble causes. This diagram contains various voltage measurements that are average for normal operation. Use instrument probes carefully to avoid causing short circuits and damaging circuit components..

4). A printed circuit board believed to be defective may also be checked by replacing it with a known good PCB, and then observing whether the problem is corrected. WHEN HANDLING A PCB, USE A "VELOSTAT" STATIC BAG FOR BOTH THE NEW AND DEFECTIVE PCB.

5). To verify the problem, as being in the defective PCB, replace the defective PCB and retest. This simple test will eliminate the possibility of having replaced a good PCB because of a loose or poor connection.

ERROR CODES

There are three error codes which the 151 module can display. If an error is detected during the operation the error code will be displayed on the keyboard LED's. This is done by alternately flashing the top row with one LED on the bottom row. The flashing LED on the bottom row corresponds with the error detected. See the following chart for the error code description.

FLASHING LED	ERROR DESCRIPTION
4	20mA Current Loop Open
5	RAM Error
6	ROM Error

6). When troubleshooting the Model 151 care should be taken to be certain that the problem is in the Model 151 and not in the indicator.

A. The following steps should be taken to isolate the problem to the defective module.

STEP 1- Check for proper line voltage to both modules.

STEP 2- REMOVE POWER, interconnecting data cable and load cell cable from the 8132.

STEP 3- Install load cell simulator in J-18 of the 8132 and restore power.

STEP 4- Check out the 8132 as a stand alone device (refer to the 8132 Technical Manual for Troubleshooting aids).

STEP 5- If the problem is found in the 8132 make all necessary repairs and reconnect all cables to the 151 and make final inspection of system.

STEP 6- If the 8132 checks good, refer to the following chart for troubleshooting the 151 module.

B. The following steps should be taken to assist in troubleshooting the 151 module.

STEP 1- Make a visual check of all cables, cable connectors, and PCB's inspecting for physical damage, loose or poor connections, and incorrect location.

STEP 2- Determine if the same problem exists in
1. all used channels
2. one or more (but not all) used channels
3. the summing mode only.

STEP 3- If problem exists in all used channels including summing, check all power supplies (see power supply drawing) for incorrect voltage, or excess ripple voltage at test points. Replace defective part (line-filter, transformer, power supply harness, or mother PCB) with known good replace part.

STEP 4- If problem exists in only the summing mode make checks described in Step 3.

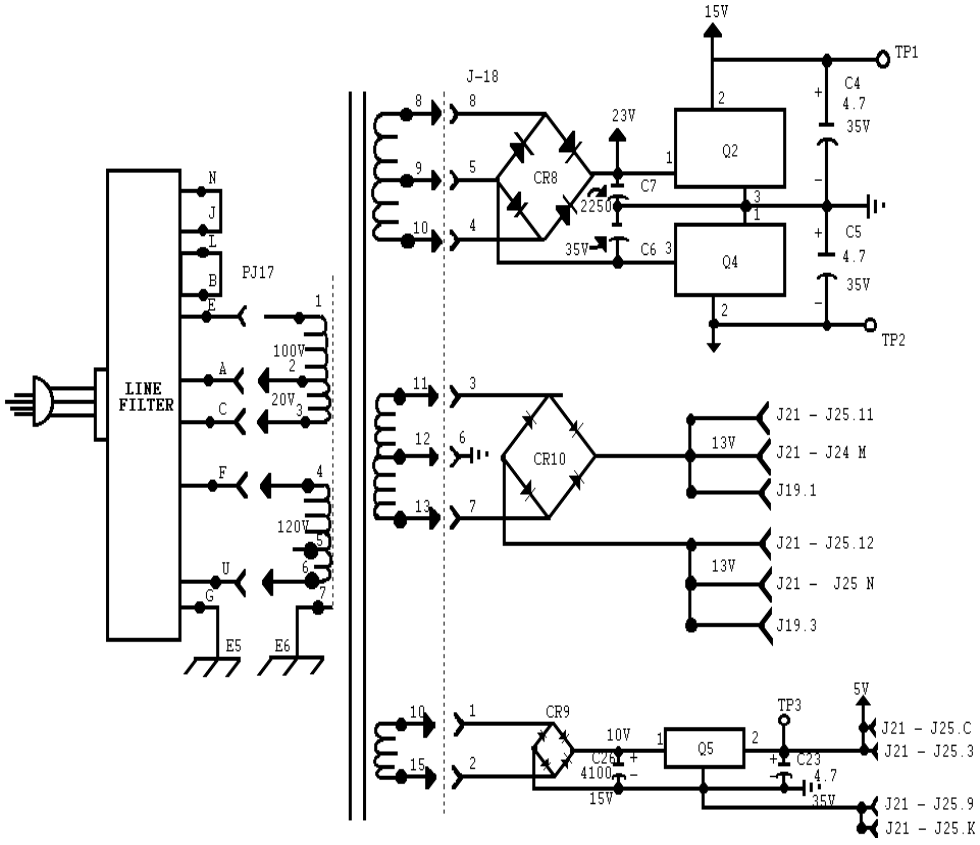
STEP 5- If problem exists in one or more, but not all of the used channels, determine which channels are the ones causing the problem.

STEP 6- After defective channel(s) are located, troubleshoot one channel at a time by installing load cell simulator into proper load cell connector (J-5 - J-10). If problem disappears in that channel, check all load cell wiring, junction box (if used), and load cells as the problem is external to the 151. If the problem is still present check internal load cell harness, or replace analog PCB with known good PCB.

NOTE: A simple troubleshooting procedure to follow when only one channel is found to be defective is the internal exchange method. This method consists of moving the replaceable parts of the defective channel, (Analog PCB, load cell(s), and load cell harness) installing these parts into a known working channel. If by doing this, the same problem occurs in the good channel, the last exchanged part is defective and should be replaced. If the problem does not occur in the good channel after all replaceable parts have been tried, the problem can be corrected by replacing the mother PCB.

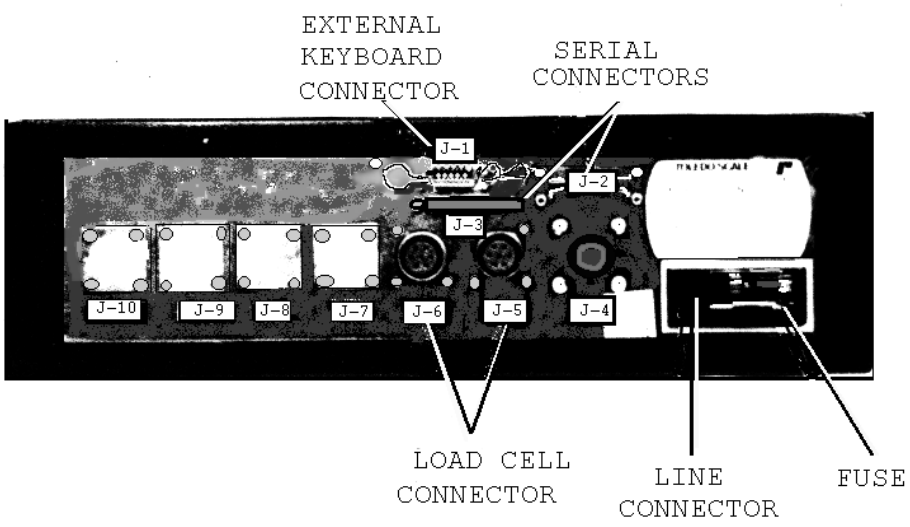
The above procedures should only be used as a guide for troubleshooting.

POWER TRANSFORMER AND CHASSIS **MOTHER PCB**



INPUT/OUTPUT CONNECTIONS

151 REAR PANEL

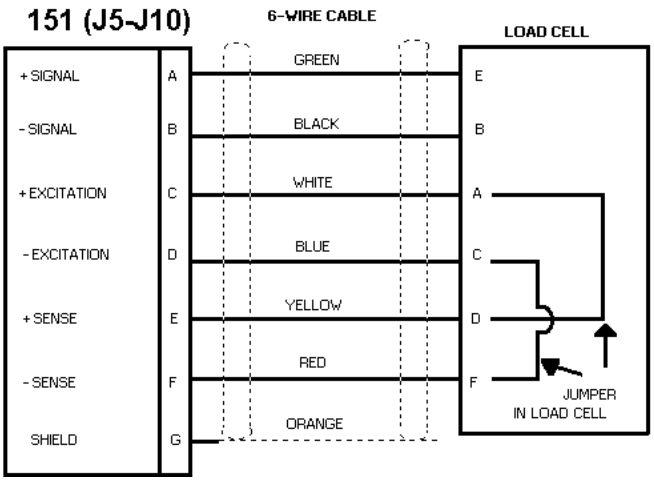


LOAD CELL CONNECTOR TABLE
7 PIN CONNECTOR

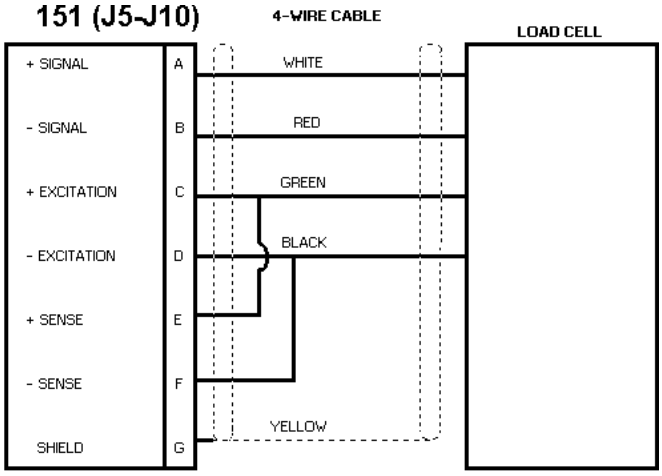
PIN		
A	+	SIGNAL
B	-	SIGNAL
C	+	EXCITATION
D	-	EXCITATION
E	+	SENSE
F	-	SENSE
G		SHIELD

TYPICAL LOAD CELL WIRING CONNECTIONS

This arrangement is Typical For a Single Load Cell System Connected Directly To The Model 151 (No junction box)

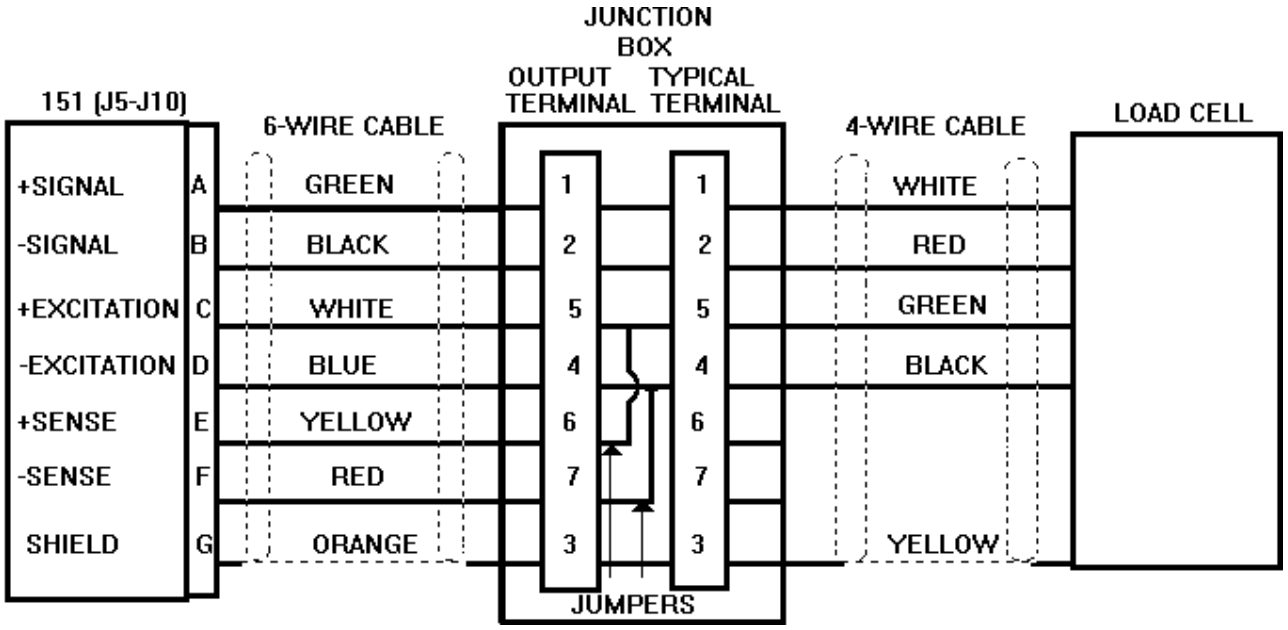


Single 6 wire cell connected directly to instrument.

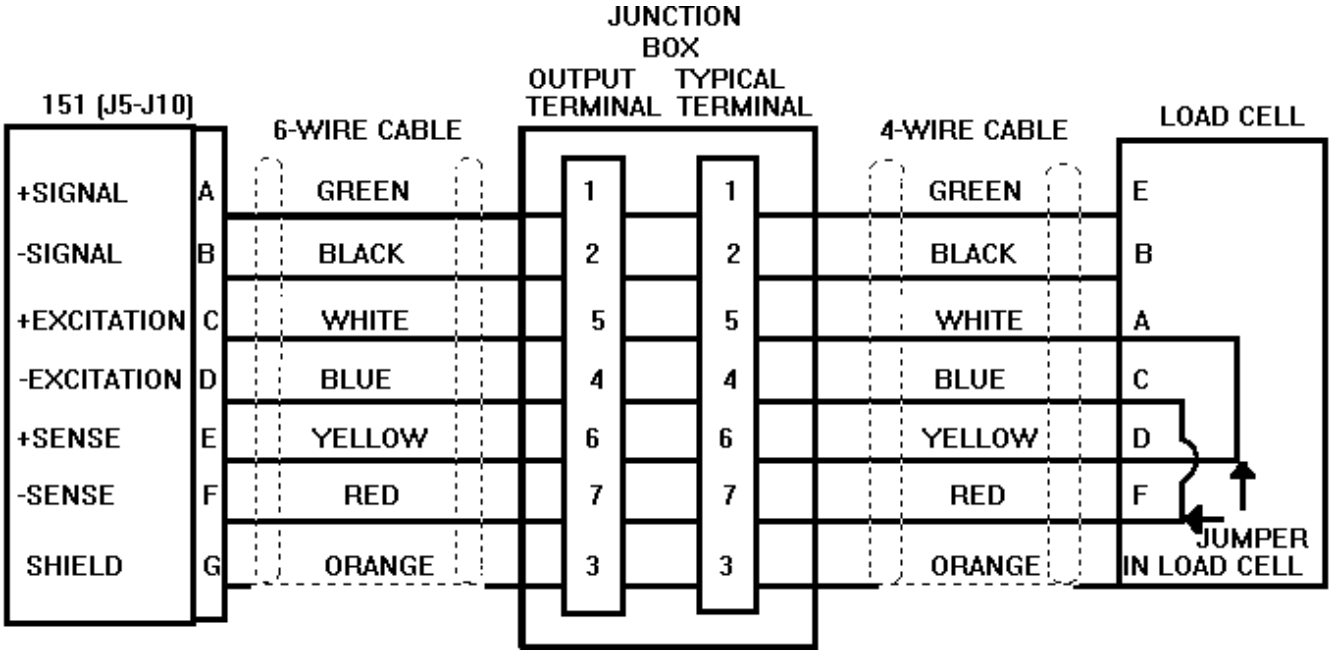


Single 4 wire cell connected directly to instrument.

These are typical load cell hookups for single and multiple cell installations with Junction box.



When using 4 wire cells, there will be jumpers between terminals 4 and 7 and between terminals 5 and 6 on TB101. On the 6 wire cells the jumpers are built into the load cell and they are between pins A and D and between pins C and F. Use terminal strip #1 if only one L/C is used.



6.6 INPUT/OUTPUT CONNECTIONS

EXTERNAL KEYBOARD - J-1

A momentary closure of the listed contacts will cause that function to be selected.

KEY	J1 PIN J1 PIN
SUM	5 to 1
1	6 to 1
2	2 to 1
3	8 to 1
4	7 to 1
5	3 to 1
6	4 to 1
TEST	9 to 1

NOTE: This cable should not exceed 10 feet.

PRINTER CONNECTOR J-2

SIGNAL NAME	151 J2	8805 J1	8810 J25	8855 J1	301 J9
+20 ma	10	28	18	22	7
20ma Common	11				
Signal Ground	12				
20ma Current Loop Supply	25	26	16	3	6
Jumpers shown are on Printer end of cable			9 to 19		
Chassis Gwd	1				

SERIAL OUTPUT INTERCONNECTING CABLES

MODEL	MODEL	LENGTH	PART NUMBER
301	151	20'	112156 00A
8805	151	6'	110837 00A
8805	151	20'	110838 00A
8810	151	6'	111502 00A
8810	151	20'	111503 00A
8855	151	6'	114285 00A
8855	151	20'	114408 00A

SIGNAL OUTPUT CONNECTIONS J-3, J-4
From 8132 - 151

SIGNAL NAME	151 J-3	8132 J-19
+20mA	10	10
20mA Common	11	11
Signal Ground	12	12
+20mA Current Loop Supply	35	25
Chassis End	7	

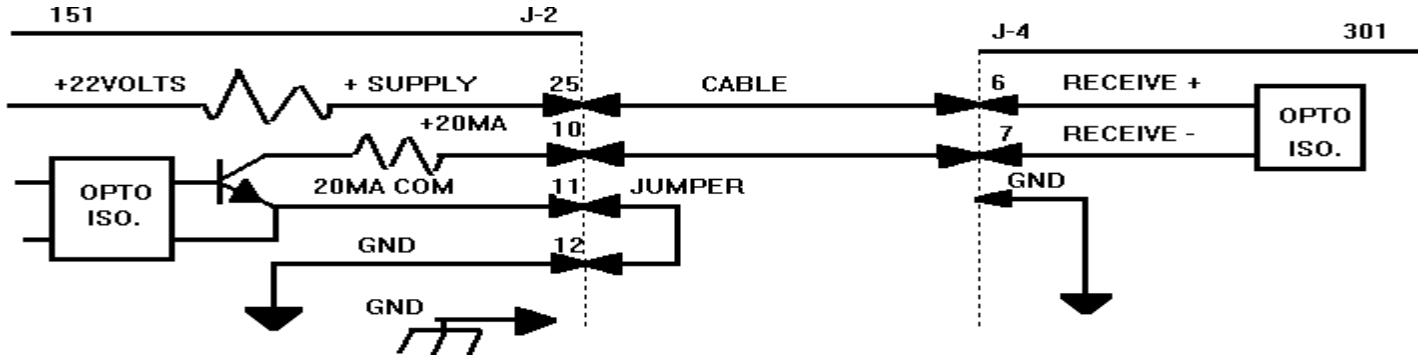
SIGNAL NAME	151 J-4	8132 J-18
+ Signal	1	1
- Signal	2	2
+ Excitation	3	3
- Excitation	4	4
+ Sense	5	5
- Sense	6	6
Shield	7	7
- MR	8	8
Analog Ground	9	9
Filter (Output)	10	10
- Clear	11	11
+ Clear	12	12
Front End (Input)	13	13
Spare	14	14
	15	15
	16	16
	17	17
	18	18
	19	19
	20	20
	21	21
	22	22
Channel #1	23	23
Channel #2	24	24
Channel #3	25	25
Channel #4	26	26
Channel #5	27	27
Channel #6	28	28

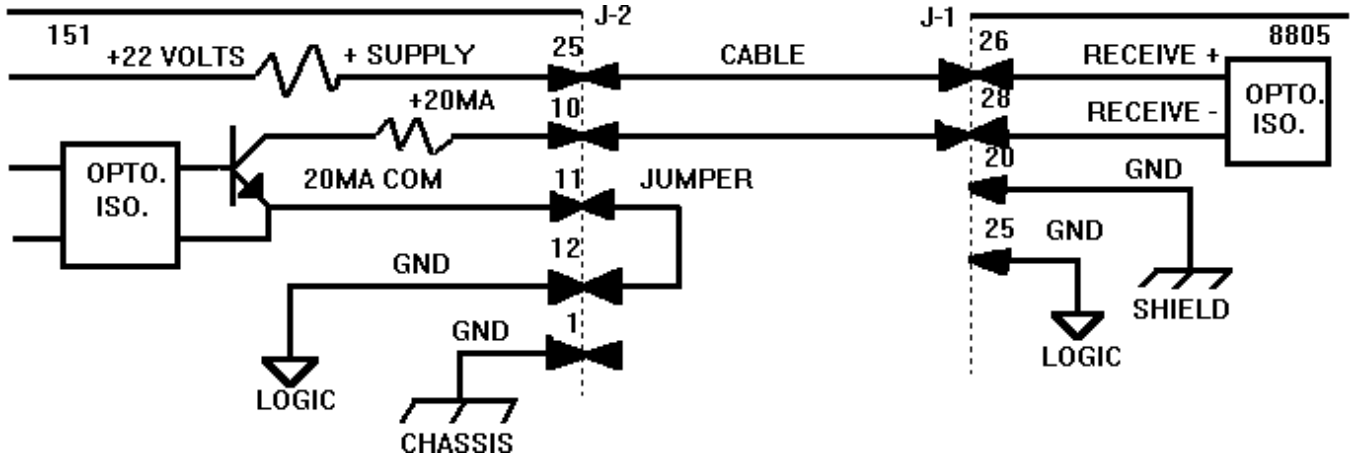
8132 TO 151 INTERCONNECTING CABLES

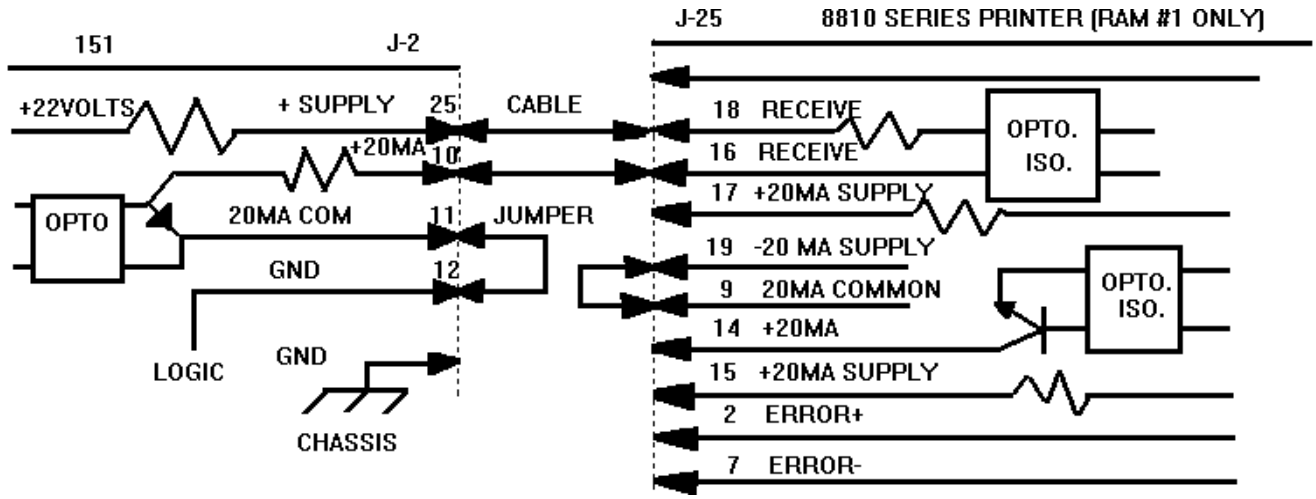
8132	151	LENGTH	PART NUMBER
J-19	J-3	36"	114131 00A
J-18	J-4	36"	114132 00A
8132 Internal Harness			112068 00A

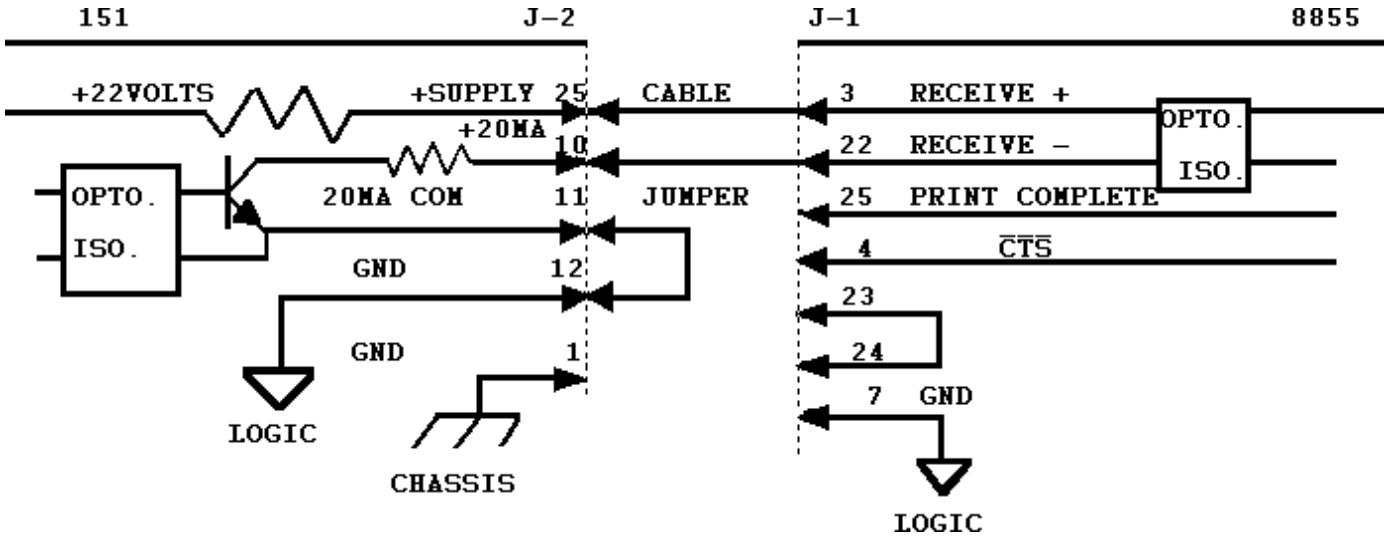
TYPICAL CONNECTIONS WITH 20 MA LOOP INPUT

The 151 uses a 20 milliamp current loop output (ASCII) for can be used with various types of interconnections to other devices.






151
J-2
J-25
8810 SERIES PRINTER (RAM #1 ONLY)
+22VOLTS
+ SUPPLY
25
CABLE
+20MA
10
OPTO
20MA COM
11
JUMPER
GND
12
LOGIC
GND
CHASSIS
18 RECEIVE
16 RECEIVE
OPTO. ISO.
17 +20MA SUPPLY
19 -20 MA SUPPLY
9 20MA COMMON
OPTO. ISO.
14 +20MA
15 +20MA SUPPLY
2 ERROR+
7 ERROR-


151
J-2
J-1
8855
+22VOLTS
+SUPPLY
25
CABLE
+20MA
10
OPTO. ISO.
20MA COM
11
JUMPER
GND
12
GND
1
LOGIC
CHASSIS
3 RECEIVE +
22 RECEIVE -
OPTO. ISO.
25 PRINT COMPLETE
4 CTS
23
24
7 GND
LOGIC

7. RECOMMENDED LIST OF SPARE PARTS

The following is a list of spare parts which should be kept on hand to eliminate lengthy customer down time.

QUANTITY	PART NUMBER	DESCRIPTION
A.R.	B112037 00A	PCB Assembly Analog
1	A112042 00A	PCB Display
1	113991 00A	Keyboard Assembly
1	A112039 00A	PCB Assembly Main
A.R.	112027 00A	Zero Pot Assembly
5	095100 00A	Fuse .6 Amp Slo Blo

A.R. -- AS REQUIRED

Some additional parts that are recommended for aid in troubleshooting this equipment are:

1	085547 020	Load Cell Simulator
1	085481 020	Volt-Ohm Meter Triplett 630
A.R.	112736 00A	Static Bag 8" x 10"
A.R.	112737 00A	Static Bag 12" x 16"

A.R. -- AS REQUIRED

In addition to these items, it is also recommended that a parts catalog also be ordered so that items not listed may be properly identified for correct and prompt delivery.

The Parts Catalog number is PC 000151 I00.

ASCII TABLE WITH BINARY CONVERSION

ASCII CHAR.	DECIMAL	HEX	76543210	ASCII CHAR.	DECIMAL	HEX	76543210
NULL	0	00	00000000	@	64	40	01000000

SOH	1	01	00000001	A	65	41	01000001
STX	2	02	00000010	B	66	42	01000010
ETX	3	03	00000011	C	67	43	01000011
EOT	4	04	00000100	D	68	44	01000100
ENQ	5	05	00000101	E	69	45	01000101
ACK	6	06	00000110	F	70	46	01000110
BELL	7	07	00000111	G	71	47	01000111
BACKSPACE	8	08	00001000	H	72	48	01001000
TAB	9	09	00001001	I	73	49	01001001
LineFeed	10	0A	00001010	J	74	4A	01001010
Vert. Tab	11	0B	00001011	K	75	4B	01001011
Form Feed	12	0C	00001100	L	76	4C	01001100
Carr.Return	13	0D	00001101	M	77	4D	01001101
Shift Out	14	0E	00001110	N	78	4E	01001110
Shift In	15	0F	00001111	O	79	4F	01001111
Data Link Esc	16	10	00010000	P	80	50	01010000
DC1	17	11	000010001	Q	81	51	01010001
DC2	18	12	00010010	R	82	52	01010010
DC3	19	13	00010011	S	83	53	01010011
DC4	20	14	00010100	T	84	54	01010100
NAK	21	15	00010101	U	85	55	01010101
SYNCH IDLE	22	16	00010110	V	86	56	01010110
End Trans. Block	23	17	00010111	W	87	57	01010111
CANCEL	24	18	00011000	X	88	58	01011000
End Of Medium	25	19	00011001	Y	89	59	01011001
SUBSTITUTE	26	1A	00011010	Z	90	5A	01011010
ESCAPE	27	1B	00011011	[	91	5B	01011011
FS (Cursor Right)	28	1C	00011100	\	92	5C	01011100
GS (Cursor Left)	29	1D	00011101	]	93	5D	01011101
RS (Cursor Up)	30	1E	00011110	^	94	5E	01011110
US (Cursor Down)	31	1F	00011111	_	95	5F	01011111
SPACE	32	20	00100000	`	96	60	01100000
!	33	21	00100001	a	97	61	01100001
"	34	22	00100010	b	98	62	01100010
#	35	23	00100011	c	99	63	01100011
$	36	24	00100100	d	100	64	01100100
%	37	25	00100101	e	101	65	01100101
&	38	26	00100110	f	102	66	01100110
'	39	27	00100111	g	103	67	01100111
(	40	28	00101000	h	104	68	01101000
)	41	29	00101001	i	105	69	01101001
*	42	2A	00101010	j	106	6A	01101010
+	43	2B	00101011	k	107	6B	01101011
,	44	2C	00101100	l	108	6C	01101100
-	45	2D	00101101	m	109	6D	01101101
.	46	2E	00101110	n	110	6E	01101110
/	47	2F	00101111	o	111	6F	01101111
0	48	30	00110000	p	112	70	01110000
1	49	31	00110001	q	113	71	01110001
2	50	32	00110010	r	114	72	01110010
3	51	33	00110011	s	115	73	01110011
4	52	34	00110100	t	116	74	01110100
5	53	35	00110101	u	117	75	01110101
6	54	36	00110110	v	118	76	01110110
7	55	37	00110111	w	119	77	01110111
8	56	38	00111000	x	120	78	01111000
9	57	39	00111001	y	121	79	01111001
:	58	3A	00111010	z	122	7A	01111010
;	59	3B	00111011	{	123	7B	01111011
<	60	3C	00111100	|	124	7C	01111100
=	61	3D	00111101	}	125	7D	01111101
>	62	3E	00111110	~	126	7E	01111110
?	63	3F	00111111		127	7F	01111111