

INSTRUCTION MANUAL
ADR-50DB
BANTAM REMOTE CLOSURE MONITOR

MAY 2007

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WARRANTY

The manufacturer warrants each unit for a period of one year to be free of defects in material and workmanship under normal use and service, the obligation of the manufacturer under this warranty being limited to replacing at the factory of manufacture any part of said unit found to be defective.

This warranty is expressly in lieu of all other warranties and representations, expressed or implied, and all other obligations, liabilities, and consequential damages which might arise out of the utilization.

1 INTRODUCTION

1.0 DESCRIPTION

The ADR-50DB Bantam Universal Closure Monitor is a very accurate method to measure the internal vacuum or pressure of cans, glass containers or plastic enclosures with a foil or metalized foil closure on a single file in-line basis. It is specifically designed for small diameter closures - 37mm glass or 200 diameter cans and larger.

The ADR-50DB consists of the on-line Bantam sensor housing, the Remote mounted Control Housing and interconnecting cables, the mechanical mount and lifter mechanism and the rejector. It is complete and ready for installation as supplied.

1.1 FUNCTION

The ADR-50DB consists of two measuring systems. The first is the Position Sense system to locate the container under test, and the second is the Proximity Sensing system to measure the lid position and hence the internal pressure.

The Position Sense system utilizes a pulsed infrared light source and tuned infrared receiver to minimize external light or noise interference.

The Proximity Sense system uses an eddy current type of measurement which responds to any type of metallic material. This sensing system assures you of extremely accurate measurements.

The ADR-50DB is capable of measuring container vacuum or pressure well in excess of 2500 containers per minute. The limiting factor is the speed of the associated reject system. The Standard Speed Rejector is capable of rejecting containers to 800 or 900 containers per minute, and the High Speed Rejector is capable of rejecting containers at a rate in excess of 2000 c.p.m.

1.1.1

FEATURES

Among the special features of the ADR-50DB are the following:

- A. Variable rate rejectors are standard on the ADR-50DB. The reject system will accommodate lines with modulated line speeds without a requirement for purchasing or installing rotary shaft encoders.
- B. Storage for production details of 100 containers for quick changeover.
- C. Autocal for instantaneous calibration.
- D. Password protection at three levels for access control.
- E. Rolling Average feature provides constant monitoring of your process to detect any changes in process parameters such as fill level, fill temperature, etc. (See 3.2.14).
- F. Rolling Average Auto-recalibration. If an unusually large shift in rolling average is encountered, you can program the ADR-50DB to recalibrate automatically.
- G. Counters. Three counters are included in the features of the ADR-50DB. They are Total Count, Net Count and Reject Count. Either Total Count or Net Count (total count less reject count) can be displayed, as well as Reject count.
- H. An RS-232 Communications Port is available to transmit ADR data.
- I. Programmable Alarms/Controls. The ADR-50DB provides as standard a control output when either the Rolling Average Upper Limit or Rolling Average Lower Limit is breached.

1.2

APPLICATION

The ADR-50DB is suitable for use on cans with conventional, pull tab or tape tab ends, with ink jet coding, embossed or debossed codes or no coding. It is not affected by product touching or coating the can end unless the product deforms the end of the can. The ADR-50DB can be used on glass containers with metal lids or with plastic lids with metal foil closures. It can be used on plastic tubs with metal foil (or plastic film with vacuum deposited metal coatings) closures.

It is best suited for small diameter closures or for glass lines where you want to detect cocked caps. The ADR-50DB will accommodate any closure up to 4 inch (100 mm) diameter. We can accommodate larger diameter closures on special order.

1.3 **OPTIONS**

1.3.1 Controls Package which provides and alarm/control output signal upon:

1. Excess consecutive rejects,
2. Excess rejects within a given quantity of containers
3. Excess rejects within a given time period
4. A repetitive pattern of rejects developing
5. A predetermined count of containers processed being achieved.

1.3.2 AIC-110 Alarm/Indicator Controller provides an interface between the ADR-50DB logic level control signal output and the devices to be driven.

1.3.3 Thank you for selecting the ADR-50DB Bantam Universal Closure Monitor. We appreciate your confidence and will do our best to provide the support necessary to assure successful use of this equipment.

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2 INSTALLATION

2.0 INTRODUCTION

Installation of the ADR-50DB Bantam Universal closure monitor has been made as simple as possible, to reduce your installation costs and line down time. By following the procedure outlined, installation will be completed quickly and painlessly.

2.1 LOCATION

Select the position on the line where the ADR-50DB Line Sensor Housing is to be installed. On lines coming from the closing machine, the ADR-50DB should be located at a point where the containers have cooled as much as possible. This will allow the containers to achieve a fairly uniform internal pressure. Variation in temperature will change the internal pressure of the container, reducing the validity of test results. Also, with greater time after closing, more leakage will occur in defective containers with a better chance of detection.

Where containers are drawn from the warehouse for labeling and shipment, the only consideration is convenience of handling. Most installations are made just before the labeler.

The location selected should be close to a leg or support on the conveyor, at a point of maximum conveyor stiffness. Since the Line Sensor Housing is supported from a single point on the conveyor side, any vibration or movement of the conveyor bed will be transmitted through the support pipe to the Line Sensor Housing. Therefore, care should be used in locating the Line Sensor Housing at a point of minimum movement in the conveyor. *Do not mount the Line Sensor Housing support pipe on an adjacent wall or building structural member, since the sensors must move with any motion of the conveyor bed. If excess motion is encountered, connect a stiffener from the conveyor to the floor or building structure.*

The ADR-50DB requires about sixteen inches (40 cm) of clear line space. It will be necessary to remove guide rail from one side of the line where the containers are being rejected.

- 2.1.1 REMOTE CABINET INSTALLATION: The ADR-50DB remote cabinet can be mounted to a wall, column or a fabricated stand near the Line Sensor Housing. The ADR-50DB is provided with 33 foot (ten meter) cable between the line sensor housing and the remote cabinet. Other lengths to 100 feet (30 meters) are available on special order.

2.2

POWER REQUIREMENTS

The ADR-50DB is wired to accept the power supply of the country of installation. It requires single phase power, 50 or 60 hertz at 1 amp. Standard voltages are 100-120 volt or 200-240 volts. Other voltages are available on special order. Check your unit to determine that it is wired for your required voltage before installation. A bright orange sticker at the point of power connection will show the correct power supply for your unit. If this sticker is not in place, be certain to verify power requirements.

NOTE: If the ADR-50DB is supplied with the RIT-800P Regulating Isolation Transformer, the RIT-800P input will be wired for the correct voltage and frequency, and the ADR and any accessories such as AIC-110 requiring external power will be wired for 100-120 volts, regardless of supply voltage. Connect to the 100-120 volt transformer output only, to avoid damage to the accessories!

Power for the ADR-50DB should not be taken from a line used to power heavy motors or motor controllers where electrical "noise" is likely to be present on the line.

Compressed Air, at 2 c.f.m., 60 to 120 p.s.i. (4 to 8 atm.) is required to operate the reject mechanism. For line speeds in excess of 500 c.p.m., the air supply line should be one half inch i.p.s. minimum.

A filter, regulator and oiler must be installed in the air line supplying the rejector.

2.3

PRELIMINARY

Unpack the unit and inspect for damage. Observe the arrow on the Delrin lead-in strip at the bottom of the line sensor housing. This indicates the direction of container flow.

Engage the ball joint (1, Figure 2.1) into the docking module (2) and lock (3) the assembly together.

Position the housing over the line at the point where the containers are to be checked. Swing the candy cane around until the cane lifter assembly is flat against the conveyor side and temporarily clamp the mounting plate to the conveyor so that the pipe is perpendicular to the conveyor bed.

DOCKING MODULE

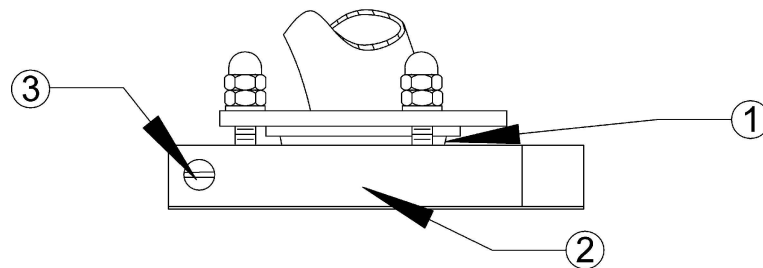


FIGURE 2.1

NOTE: The support pipe may be mounted upstream or downstream from the housing on either side of the conveyor. Check the Delrin lead-in strip for correct line flow direction. If this is wrong, loosen the ball joint and rotate the housing on the candy cane, turning the housing to align the arrow with flow direction.

With the cane lifter mounting bracket clamped to the conveyor, make a preliminary adjustment for container height. Crank the cane lifter to its highest position. Loosen the four nuts clamping the cane lifter to the candy cane pipe and raise the candy cane so that the ADR will clear the tallest container to be checked. Snug, but do not tighten, the pipe clamping ring nuts. Place the tallest container to be checked under the ADR sense probe. Adjust the position of the candy cane pipe in the cane lifter so that the Foot Pad clears the top of the container by at least one inch.

Lower the Bantam housing with the cane lifter handwheel until the Foot Pad just touches the top of the container. Swing the Bantam housing across the line so that the top of the container is centered under the housing. Tighten the four nuts to lock the pipe in the cane lifter, and tighten the four acorn nuts to secure them.

Remove the tallest container to be tested from the line and replace with the shortest container to be tested. Crank the can lifter down to see that the height adjustment will cover the full range.

Adjust the conveyor guide rails so that there is about 1/4" (6 mm) clearance between guide rails and the containers, where the containers pass under the Bantam head. The containers must not touch the conveyor guide rails while they are between the Bantam Head guide rails. If they do touch, they will drag and tilt the containers causing false readings.

Check to see that the rejector can be mounted on one side of the line after the containers have cleared the Bantam head, and that provisions for rejected containers can be made on the other side. If everything is clear, proceed with permanent installation.

2.4

SENSOR FOOT PAD

The ADR-50DB utilizes a variety of sizes of Sensor Foot Pad to reference off of the top of the containers under test. Table 2.1 below shows the size, part number and maximum lid diameter for each Sensor Foot Pad.

MAXIMUM CLOSURE DIAMETER			
NO.	DIAMETER	INCHES	MM
1	200	2.000	50
3	202	2.125	55
5	211	2.687	65
7	203	3.187	80
9	400	4.000	100

TABLE 2.1

The Sensor Foot Pad is approximately square, with the width of the container lid determining the minimum width of the Sensor Foot Pad. Center-to-center minimum distance between containers determines the maximum size of the Sensor Foot Pad. For example, if a glass jar 80 mm in diameter with a 38 mm diameter lid is being run, any Sensor Foot Pad in excess of 38 mm wide, up to 80 mm wide could be selected. If a Sensor Foot Pad less than 38 mm is selected, the pad would not cover the entire diameter of the lid, while if a pad greater than 80 mm is selected, the following container could lift the pad while the measurement is being taken.

It may be necessary to space the containers passing under the ADR in order to assure that a following container will not lift the pad while a measurement is being made.

2.5 PERMANENT INSTALLATION

- 2.5.1 **EQUIPMENT MOUNTING:** Attach the cane lifter assembly to the conveyor bed permanently. If there is insufficient stiffness when the unit is attached, stiffen with through-bolts and spacers to the other side of the conveyor.

Connect the cable between the Bantam line sensor housing connector at the bottom of the candy cane and the remote housing. Connect the cable between the rejector and the remote housing. Refer to Installation Drawing (Fig. 2.3).

- 2.5.2 **ELECTRICAL INSTALLATION:** Bring a power line with ground into the lower left hand entryway in the remote housing (Fig. 2.3, A). We recommend conduit or flexible metallic or non-metallic sealtight conduit. If a rubber jacketed power cord is used, be certain that a waterproof compression bushing is used to seal the entryway.

To gain access to the interior of the remote enclosure, loosen the four captive screws at the corners of the ADR-50D front panel and remove the ADR-50D Waterproof Enclosure and Amplifier assembly from the stainless steel remote cabinet panel. Disconnect the cables from the back of the waterproof enclosure and set the unit aside.

Insert three wire power cable into the remote cabinet (A, Figure 2.3) and route wires to the terminal block (Figure 2.2) in the rear of the remote cabinet.

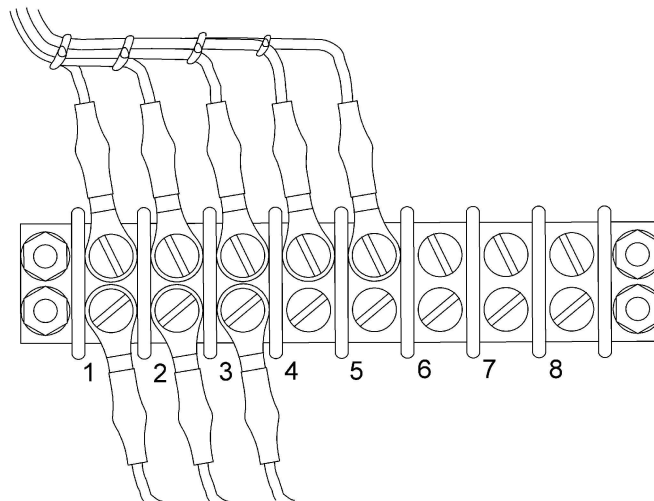


FIGURE 2.2

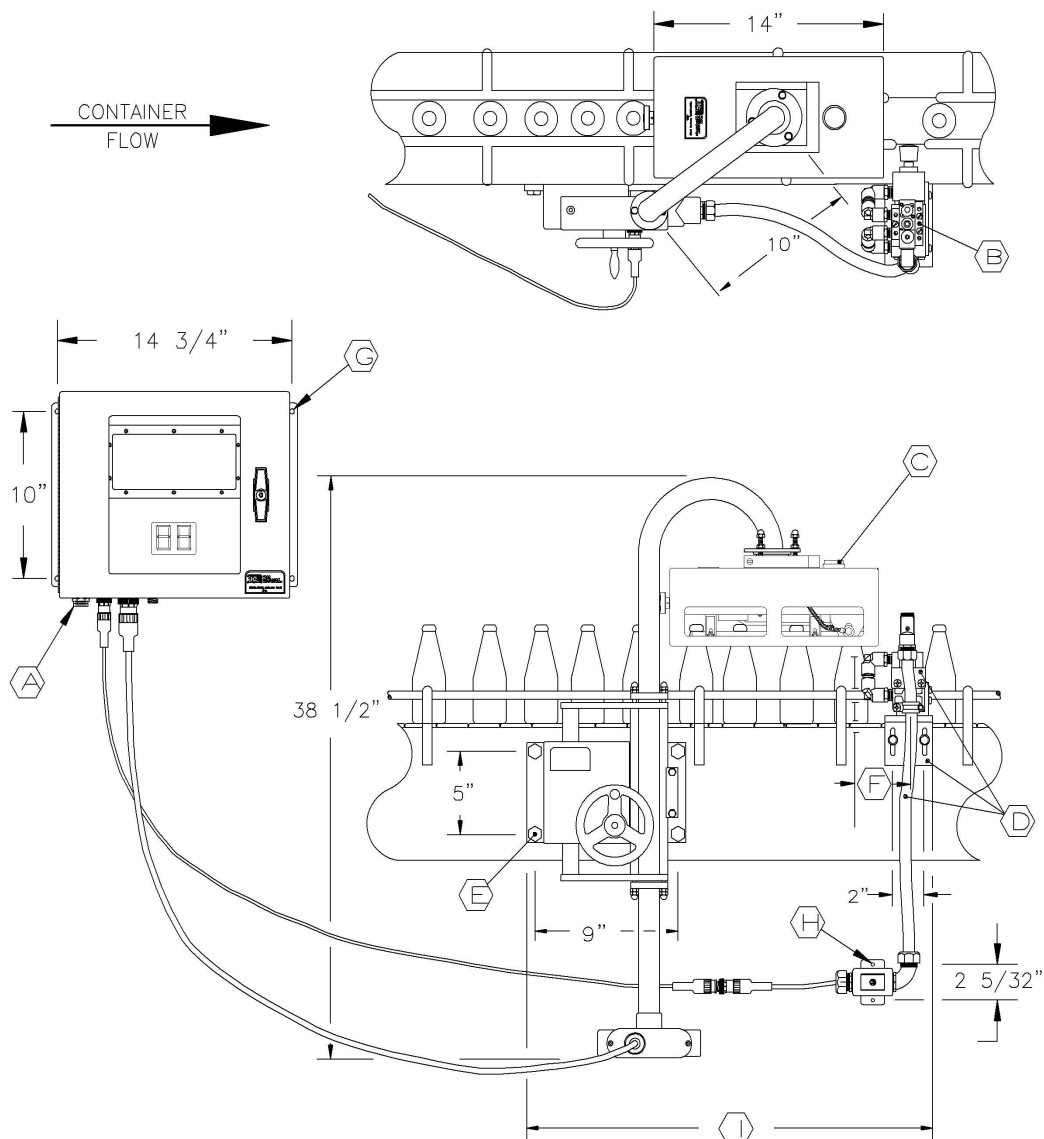
Wire as shown in Figure 2.2. Terminal 1 is equipment ground (earth), Terminal 2 is power in L-1, and Terminal 3 is neutral L-2. **NOTE:** Terminal 1 must be wired to a solid ground point. Failure to ground properly will result in false rejects, possible equipment damage and possible shock hazard.

Be sure to tighten the entryway bushing to assure waterproof integrity of the cabinet. Re-install the waterproof enclosure and amplifier assembly.

- 2.5.3. **REJECTOR INSTALLATION:** Mount the air cylinder rejector to the side of the conveyor at a convenient point one-half to ten container diameters downstream from the Bantam line sensor housing. The rejector should be positioned vertically so that the rubber bumper is slightly below the center of the container to be rejected. Set the rejector so that the stroke is angled downstream about fifteen degrees, not perpendicular to container flow. If necessary, remove a section of guide rail to clear the rejector hammer. Then slide the rejector forward until hammer just clears the container. If there is too much space between the rejector bumper and the edge of the container, the rejector stroke may be too short after contact, and the bumper may be accelerated enough to damage the container at impact.

Remove the guide rail on the opposite side of the line for a sufficient distance to clear the containers being rejected. This is usually about one-half container diameter plus six inches downstream from the center and one-half container diameter upstream. It may be necessary to increase this for higher line speeds. Attach a filtered air line to the rear of the rejector.

Attach a reject receiving tray or carry-off device for the rejected containers. This completes installation.



- A. A/C Power Inlet
- B. Rejector air inlet, 1/4" I.P.S. requires 60-150 P.S.I., 3 C.F.M. continuous cycling. Air must be dried and filtered.
- C. Bull's Eye Level
- D. Air rejector cylinder and mounting bracket assembly. Shipped assembled and wired. May be located on either side of line. Two (2) slots, 9/32" x 1-21/32" located as shown.
- E. Cane mounting bracket assembly. Four (4) holes, 7/16" diameter. Located as shown.
- F. Determined at installation. (Must not exceed maximum distance of reject delay adjustment).
- G. Remote Cabinet Assembly. Four (4) holes, 5/16" diameter. Located as shown.
- H. Disable Switch enclosure assembly. Two (2) holes, 7/32" diameter. Located as shown.
- I. Minimum line distance required, 16" (See Note F).

INSTALLATION DRAWING, ADR-50DB

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3 OPERATION

3.0 MECHANICAL ADJUSTMENTS

The initial mechanical set-up of the ADR is the most critical part of the operation of the unit. Improper adjustments may cause apparent drift and instability, insensitivity, or complete failure. In a large percentage of apparent electronic troubles, the cause is really improper mechanical adjustment.

The new Bantam line sensor housing with it's unique single-point adjustment greatly simplifies the mechanical setup of the ADR.

- 3.0.1 Swing the Bantam line housing across the conveyor so that the line housing is centered over the container line of travel. Lower the Bantam head until the Sensor Foot Pad (Figure 3.1) just clears the top of a test container. Adjust the Bantam diameter adjustment knob so that a container will pass between the Bantam Guide Rails without touching the rails on either side.

BANTAM LINE SENSOR SYSTEM

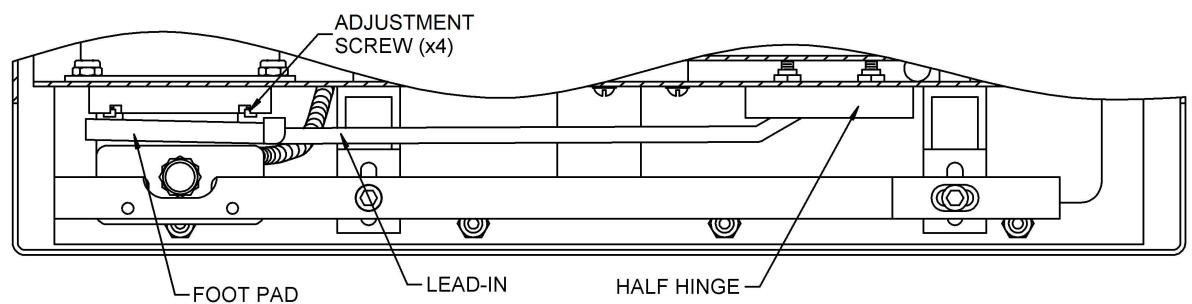


FIGURE 3.1

- 3.0.2 Level the Bantam line sensor housing by adjusting the three ball joint adjustment screws (Figure 2.1) while referring to the bull's eye level on the top of the housing.
- 3.0.3 With the conveyor running, pass a container under the Bantam. Swing the Bantam housing across the line so that the container passes under the housing, centered between the guide rails. Rotate the housing so that the container passes between the Bantam guide rails without touching either rail. Bring the Bantam rails together until they just clear the container at the point of contact.

When the container passes between the Bantam guide rails, be sure that it does not touch the conveyor guide rail on either side. It must not touch the conveyor guide rails, or it will cause the container to tilt or bind as it passes under the Bantam.

When these adjustments are completed, lock the ball joint and cane lifter swivel lock nuts.

3.0.3.1 Notice that the Bantam guide rails open and close to adjust for container diameter. This motion also carries the light source and photosensor mounted on the guide rails centering the probe.

3.0.4 POSITION SENSE ADJUSTMENT. Observe the mounting of the light source and photosensor assemblies on the guide rails. If the notch on the guide rails faces up, and the photosensor and light source assemblies are above the guide rails, they are set up for glass jars or necked down cans. The position sense infrared light beam will pass very near the top of the container, assuring that it will be interrupted by the metal closure of a glass jar or the necked down portion of a can. There is a fine adjustment of the height of the light beam. This can be adjusted to fit your requirements by adjusting the height of the guide rails at the guide rail supports.

If the notch in the guide rails points down, the photosensor and light source mount below the guide rails and the infrared light beam passes about 1" (25 mm) below the top of the container. To change the position of the light beam, switch the Bantam guide rails to the opposite side guide rail supports.

TILT LIMIT ADJUSTING SCREWS

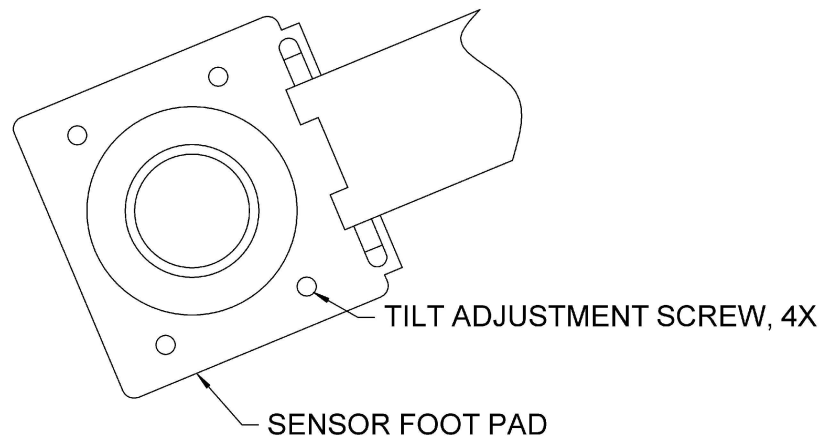


FIGURE 3.2

3.0.5 COCKED CAP DETECTION: The gimbal mount of the sense probe allows the Sensor Foot Pad to tilt as much as 7° off of horizontal to accommodate eccentric container tops. This tilt of the Sensor Foot Pad may be great enough to accommodate the tilt of a cocked cap. The amount of tilt allowed can be reduced by adjusting the Tilt Limit Screws in the sensor housing (Figure 3.2).

As supplied, these screws are adjusted to not interfere with the Sensor Foot Pad.

To limit the tilt, drop the lead-in (Figure 3.1) and rotate the Sensor Foot Pad until the holes in the pad align with the socket heads of the tilt-adjust screws. Back the screws out until the reduce the amount of tilt allowed to an amount that will cause the Sensor Foot Pad to lift from the low edge of a cocked cap. This will cause the sensor to give a low reading, causing the jar to be rejected.

When making this adjustment, start with the screws turned all of the way in. then back the screws out until the tilt is restricted. We suggest that you count the number of turns as you back each screw out to assure that the tilt is restricted the same amount in every direction. Back the screws out either 1 or 2 full turns each, in a circular pattern, until you have reached the level of tilt restriction you need.

- 3.0.6. HEIGHT ADJUSTMENT: With the conveyor running, repeatedly pass a container under the Bantam line housing. Loosen the cane lifter locking nuts and lower the Bantam line housing until the container lifts the Sensor Foot Pad 1/16" (1.5 mm) to 3/32" (2.5 mm). Tighten the cane lifter lock nuts.

When running production you may need to touch up the height adjustment. Excess 00 rejects suggest that you need to lower the Bantam line sensor housing to cause the sensor to lift higher.

Because of the nature of the ADR-50DB mount, there is some interaction between the various mechanical adjustments, so before starting the line, check carefully to see that all of the final mechanical settings are correct.

3.1 CALIBRATION/OPERATION

The ADR-50DB is extremely simple and straightforward to calibrate at initial setup, and even easier to return to the setup for a product you have run before. After you have accomplished the mechanical setup described in section 3.0, you power up, and tell the ADR-50DB the distance from the sensor to the reject. You never have to enter that again unless the distance changes. (All information you enter is stored in battery powered RAM, where it will remain until you change the information or for ten years, whichever comes first.)

To calibrate the ADR-50DB for a specific container, you tell the ADR-50DB the container diameter and then pass a good container under it. THAT'S IT!

You will want to nail things down even closer than that rudimentary setup, but that is the basic calibration procedure, and your ADR-50DB will provide you with some protection with no further calibration from the very first container that passes through the ADR.

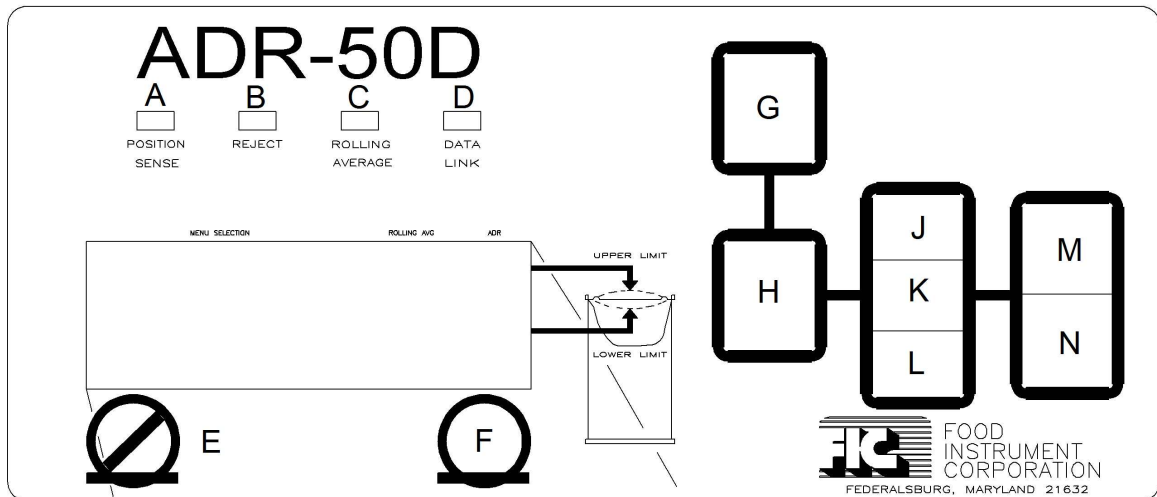
- 3.1.0.1 You communicate with your ADR-50DB through the front panel controls and indicators. The ADR reports to you and coaches you through the Liquid Crystal Display (LCD) and LED Status Indicators. You enter instructions through the Keys on the front panel.

In the following test, each step in the setup will be preceded by a bracketed two number group **[1/03]** which refers to the MENU (1 in the example) and to the SELECTION from the menu (03 in the example). These numbers correspond to the numbers in the lower left hand corner of the LCD display panel. To get to the menu you want, repeatedly press the MENU button until it cycles (1-9) to the number you want, and then the SELECT button until it cycles (1-99) to the selection you want within the selected menu.

- 3.1.0.2 The menus are groups of like-oriented functions, as follows:

MENU 1	BASIC ADR-50DB SETUP PARAMETERS
MENU 2	SETUP FOR CONTAINERS YOU RUN, INSTALLED IN MEMORY FOR RECALL AS NEEDED
MENU 3	CONTAINER COUNTER CONTROLS
MENU 4	COMMUNICATIONS (Option)
MENU 5	PROGRAMMABLE COUNTERS (Option)
MENU 6	PASSWORD ACCESS
MENU 7	PASSWORD CONTROL AND ENTRY
MENU 8	NOT USED
MENU 9	TEST & INFORMATION

3.1.0.3 FRONT PANEL DISPLAY/CONTROLS



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
A	A	D	J	.	C	O	N	T	R	A	S	T		5	2	.	5		7	5	
B										S	/	A		5	0	.	2		5	1	
C			N	E	T	-	0	1	1	4	6	3	2		4	7	.	5		2	5
D	1	/	0	1				0	0	1	1	8		5	3	.	0		9	9	

LCD DISPLAY FORMAT

The following list gives the location and description of each of the areas of the Liquid Crystal Display used to communicate visually with you.

<u>AREA</u>	<u>FUNCTION</u>	<u>DESCRIPTION</u>
A1-A12	MENU IDENTIFIER FIELD	Alphanumeric
B1-B7	DATA ENTRY FIELD	Alphanumeric
B10	PASSWORD SECURITY IND.	Alphanumeric
B12	PASSWORD ACCEPTED IND.	Alphanumeric
D1	MENU NUMBER	Numeric, 0-9
D3-D4	SELECTION FROM MENU	Numeric, 00-99
C2-C5	NET COUNT INDICATOR	Alphanumeric
C6-C12	TOTAL CONTAINERS	Numeric, 0-9,999,999
D8-D12	REJECT CONTAINERS	Numeric, 0-99,999
A14-A17	UPPER LIMIT, ROLLING AVG	Numeric, 00.0-99.9
B14-B17	ROLLING AVERAGE	Numeric, 00.0-99.9
C14-C17	LOWER LIMIT, ROLLINGAVG	Numeric, 00.0-99.9
D14-D17	LAST OUT-OF-LIMITS, R.A.	Numeric, 00.0-99.9
A19-A20	UPPER LIMIT, ADR	Numeric, 00-99
B19-B20	ADR READING	Numeric, 00-99
C19-C20	LOWER LIMIT, ADR	Numeric, 00-99
D19-D20	LAST OUT-OF-LIMITS, ADR	Numeric, 00-99

LED INDICATORS

A - POSITION SENSE LED INDICATOR

COLOR	STEADY	BLINKING
GREEN	Photosensor Clear	Containers Running
YELLOW	ADR Not Calibrated	Low Photosensitivity
RED	Static Test	No Signal
DARK	Sensor Blocked	

B - REJECT LED INDICATOR

COLOR	STEADY	BLINKING
RED	Rejector Disabled	Blinks When Rejecting
YELLOW	----	Blinks - Disabled Reject
DARK	Dark When Idle	Dark When Idle

C - ROLLING AVERAGE LED INDICATOR

COLOR	STEADY	BLINKING
GREEN	Within Limits	-
YELLOW	Accumulating Sample	Low Limit Excursion
RED	Turned Off	High Limit Excursion

D - DATA LINK LED INDICATOR

COLOR	STEADY	BLINKING
GREEN	On	Transmitting
YELLOW	Waiting Data	Bidirectional
RED	Off	Error

SWITCHES

E -	REJECT DISABLE	Prevents Rejector from firing.
F -	REJECT ENABLE	Allows Rejector To Fire.
G -	MENU KEY	Menu Key selects menu numbers 1 through 9.
H -	SELECT KEY	Selects items 1-99 on selected menu.

J/K/L -UP/NEXT/DOWN

Three switches. These switches are used to respond to queries or to enter data. "J", the UP Key, increments numbers upward at the cursor, or causes the query "YES?" to switch between YES and NO in the display field B1-B5.

"K", the NEXT Key, moves the cursor left to right in any area where numbers are to be entered into more than one column.

"L", the DOWN Key, increments numbers downward at the cursor, or causes the query "YES?" to switch between YES and NO in the display field B1-B7.

M/N - CLEAR/ENTER

Two switches. "M", the CLEAR Key, is used to clear numbers at the cursor field, changing numbers to 0 or the minimum number for that value. Use the "CLEAR" Key to reset counters to "0" [MENU 3]. **NOTE: In ALL cases, you must press the ENTER Key after CLEAR - EXCEPT when using AUTO-CAL [2/03].**

"N", the ENTER Key. Press ENTER to store information you have generated, either numeric or Yes/No.

NOTE: THE REMAINDER OF THIS SECTION IS DEVOTED TO A DEPICTION OF EACH OF THE AVAILABLE SELECTIONS OF EACH MENU, AND HOW THAT SELECTION EFFECTS THE OPERATION OF YOUR ADR-50D.

3.1.00 [MENU 1] Menu 1 is used to enter information that is specific to your installation, such as Rejector type, distance between Sensor and Rejector, or to provide information such as unit Serial Number. All information that is known at the time of shipment will be programmed into Menu 1 at the factory. Normally, you will only have to enter the distance from sensor to rejector (Menu 1/03 ADJ.REJ.DST.) at installation. Once done, you will not need to make any changes to Menu 1 until you modify your installation.

3.1.1 [1/01] SCREEN CONTRAST CONTROL

A	D	J	0	C	O	N	T	R	A	S	T									7	5
																				5	0
																				2	5
1	/	0	1																		

Keystrokes: UP Key (repeatedly) to increase contrast, DOWN Key to reduce contrast.

At power-up, or after a power interruption, the ADR Menu/Selection always starts at Menu position 1/01.

3.1.2 [1/02] SELECT REJECTOR TYPE

S	S	R	-	1	0	0	0		=	Y	?									7	5
Y	E	S																		5	0
																				2	5
1	/	0	2																		

Keystrokes: UP Key to switch between YES and NO, ENTER.

Set to YES if you have an SSR 1000 Standard Speed Rejector, NO if you have an HSR-2000 High Speed Rejector.

3.1.3

[1/03] ADJUST REJECTOR DISTANCE

A	D	J	.	R	E	J	.	D	S	T	.									7	5
2	5	4	mm																	5	0
																				2	5
1	/	0	3																		

Keystrokes: UP/DOWN Key, NEXT Key, UP/DOWN Key, NEXT Key, UP/DOWN Key, ENTER.

In all examples, the shaded area (as in the numbers 254 above) represent the active area that you will work in. The darker block shows a cursor. Until you have entered a value, the cursor is an underline under the active figure. When you enter a new figure, the cursor changes to a dark background blinking the new figure. The cursor will continue to blink until the changes you have made are entered into memory by pressing the ENTER Key, or are canceled by moving off of this menu selection without first pressing the ENTER Key.

After installation is complete, measure the distance between the Photosensor and the Rejector Bumper. (If you measure in inches, multiply the distance by 25.4 to convert inches to millimeters (mm). Round off to the nearest whole number of millimeters.) Enter the distance in millimeters into the display. Be sure that the correct distance in millimeters (inches X 25.4) is displayed. If there is an error, press CLEAR and re-enter the number. Then press ENTER to record the distance in memory.

FINE TUNING It may prove necessary to make a fine adjustment of the rejector distance after you have finished entering the container data in Menu 2. **NOT NOW!** If the rejector hits the container too soon (or before the container arrives), come back to this Menu and Selection **[1/03]**. Increase the distance number slightly and press the ENTER Key. If the Rejector hits the container too late (or after the container passes), reduce the number and press the ENTER Key. You cannot test for accuracy until you have determined and entered the container diameter into memory **[2/02]**.

Once this number has been entered and proven, it will never be necessary to alter it until you move the position of the rejector.

3.1.4 [1/04] PROBE SELECT

M	I	N	I	P	R	O	B	E	=	Y	?									7	5
N	O																			5	0
1	/	0	4																	2	5

Keystrokes: UP Key, UP Key, ENTER

The ADR-50DB Bantam utilizes a small Sense Probe exclusively. The ADR-50D and ADR-50DR may use either the standard probe or the miniprobe. The standard probe is used for most can or glass applications. The miniprobe is recommended for use with small diameter closures and pull tab cans. You can identify your probe by inspecting the probe on the reference strip. If the probe is about 1.5" (38mm) diameter it is the standard probe. If it is about 1" (25mm) diameter, set in a 1.5" (38mm) base, it is a miniprobe. Select YES for the Bantam ADR-50D, or the ADR-50D or ADR-50DR equipped with the miniprobe. Select NO for the ADR-50D or ADR-50DR equipped with the standard probe.

3.1.5 [1/05] DISPLAY UNIT SERIAL NUMBER

S	E	R	I	A	L	#														7	5
1	2	3	4	5																5	0
1	/	0	5																	2	5

Passive screen. Displays your unit serial number and other selected values only.

This completes the line specific information. The information you have entered will not change until the Rejector is moved or until the unit is converted from or to Bantam operation.

3.2. MENU 2 ENTER CONTAINER SPECIFIC INFORMATION

In MENU 2, you set up a file for each container you run. Once you have loaded the data into the file and saved it, any time that you run the container, you simply recall that file and load it into the ADR-50D. The ADR is then ready to run that container when you have adjusted the guide rails and container height.

NOTE: PASSWORD SECURITY: If Password Security is active, you cannot enter any parameters until you have entered a valid password **Menu [6/01]**. To change any parameter in MENU 2, a valid password must be entered.

The new value will remain in effect until a new container number is selected **MENU [2/01]**. To make the change permanent, you must save the change at **[2/12]**, which can only be done with the Supervisor's Password entered at **[6/01]**. If you do not save the changes at **[2/12]**, the values in Menu 2 will revert back to the values in effect before you entered the changes.

3.2.1 [2/01] LOAD CONTAINER NUMBER

L	O	A	D		C	O	N	T	N	R	#								7	5
0	1																		5	0
																			2	5
2	/	0	1																	

Keystrokes: UP/DOWN, NEXT, UP/DOWN, ENTER

You can enter data for up to 100 containers. The information to be entered includes Container Diameter, Calibration Level, Accept Range limits, Rolling Average parameters and sensitivity. Once you have established this data for each container you run, to recall the data for the container you are going to run, simply call up Menu **[2/01]**, load the container number and press ENTER. The ADR-50D will then be electrically set up to run that container. You will have to adjust the ADR height and your guide rails to accommodate mechanical changes in the container.

3.2.2 [2/02] SET CONTAINER DIAMETER

C	O	N	T	N	R		D	I	A	.										7	5
0	7	5	m	m																5	0
																				2	5
2	/	0	2																		

Keystrokes: UP/DOWN, NEXT, UP/DOWN, NEXT, UP/DOWN, ENTER

Enter the diameter of the container at the height where it breaks the photosensor/IRLED beam, usually the body diameter for a can or plastic tub, or the cap diameter for a jar. This measurement is in millimeters. If you measure in inches, multiply by 25.4 to convert to millimeters. Round off to the nearest whole number.

The range of diameters is 25mm (1 inch) to 165mm (6 1/2 inches). The accuracy of your measurement determines the ability of the Rejector to track conveyor speed. BE ACCURATE!

3.2.3 [2/03] ADJUST SYSTEM SENSITIVITY

A	D	J	.	S	E	N	S	T	V	T	Y									7	5
1																				5	0
																				2	5
2	/	0	3																		

Keystrokes: UP/DOWN (Range 0 - 4), ENTER

Settings 0,1 and 2 expand or reduce the value of an ADR reading. A setting of 0 provides the least change in ADR reading for a change in lid position; a setting of 2 gives the greatest change in ADR reading for a change in lid position. Setting 3 Increases probe sensitivity for deep cans such as coffee cans, while setting 4 reduces probe sensitivity for containers where the lid is very close to the probe face, such as a jar lid.

3.2.4 [2/04] AUTOMATIC CALIBRATION

A	U	T	O	C	A	L	=	C	L	R	?								7	5
																			5	0
																			2	5
2	/	0	4																	

Keystroke: CLEAR

To recalibrate the ADR-50D at any time, select Menu **[2/04]** and press the CLEAR key. When the next container passes, the ADR-50D will automatically adjust it's calibration to give an ADR value of 50 on the display. This should be done when the conveyor is running, using a known good container. It can be done when there is full container flow, but you then have no knowledge of the quality of the container on which it calibrated.

3.2.5 [2/05] NOT USED

3.2.6 [2/06] NOT USED

3.2.7 [2/07] NOT USED

3.2.8 [2/08] NOT USED

3.2.9 [2/09] NOT USED

3.2.10 [2/10] ADJUST ADR-50D CALIBRATION

A	D	J	.	C	A	L	I	B	R	T	N		5	2	.	5		7	5
1	2	8											4	6	.	1		5	0
													4	7	.	5		2	5
2	/	1	0										4	6	.	1			

Keystrokes: UP or DOWN Key repeatedly (Range 00-245), ENTER

This screen allows you to fine-tune your ADR-50D Calibration. This control, used while observing the Rolling Average **[2/16]**, allows you to achieve an extremely accurate calibration based on a large sample (256 containers) on a real-time basis. To achieve a change in the calibration as indicated by the three digit number (second row, left), you pulse the UP or DOWN button to increase or decrease the calibration level (range of 245), then press enter. When you press enter, the Rolling Average **[2/16]** will move slowly to a new value.

3.2.11

[2/11] SET UPPER LIMIT

[illegible]

Keystrokes: UP/DOWN, NEXT, UP/DOWN (Range 00-99), ENTER

The ADR UPPER LIMIT determines the level above which lids that are too high are rejected. This setting can best be determined by observation of reject containers. The Upper Limit controls the "Internal Pressure Too High" set point. (Remember, higher pressure means lower vacuum.) If containers with pressure too high are being accepted, lower the Upper Limit. If containers with acceptable pressure or vacuum are rejected, raise the Upper Limit. A setting of 99 for the upper limit will disable the Upper Limit Reject function.

CAUTION - Setting the LOWER LIMIT higher than the UPPER LIMIT will cause all containers to be rejected.

3.2.12

[2/12] SET LOWER LIMIT

[illegible]

Keystrokes: UP/DOWN, NEXT, UP/DOWN (Range 00-99), ENTER

The ADR LOWER LIMIT controls the reject level below which containers are rejected. This limit rejects low pressure (or high vacuum) containers, as well as containers with missing lids. A setting of 00 disables the Lower Limit Reject function.

CAUTION - Setting the LOWER LIMIT higher than the UPPER LIMIT will cause all containers to be rejected.

3.2.13 [2/13] E-Z OPEN CONTAINERS

E	Z		O	P	E	N			=	Y	?							7	5
Y	E	S																5	0
																		2	5
2	/	1	3																

Keystrokes: UP, ENTER

This menu selection configures the ADR-50D for a Pull-Tab Container (YES) or Non-Pull-Tab Container (NO). The UP Key switches the display between YES and NO. When the correct response is displayed, press ENTER.

3.2.14 ROLLING AVERAGE

The Rolling Average function is a unique feature of the ADR-50D. As each container passes under the ADR-50D, it generates a value between ADR-00 and ADR-99, proportional to the relative lid position of the container. Each of these values is accumulated until 256 containers have been tested. The 256 values are averaged and the average, if Rolling Average is enabled, is shown on the second line of the display, to the left of the ADR value. As each new container is tested, the first value in the queue is discarded, the new value added, and a new average is calculated. The display is updated once each second.

While the ADR display reflects the instantaneous value for each container, it is very difficult to observe trends until they are well established, perhaps beyond the limits of safety. The Rolling Average will vary very little unless there is a change in one or more process parameters, in which case the change will be noted almost immediately. If a change occurs, the Rolling Average will begin to move to a new level, and the new Rolling Average will settle out after 256 containers have passed. At five hundred containers per minute, this change to a new level will be complete in one half minute.

The Rolling Average Limits [2/14] and [2/15] can be set very close (depending on the uniformity of your process) to the Rolling Average value, usually within 2 or 3. In the example below, the Rolling Average Limits are set to $\pm 2\frac{1}{2}$ of the average reading at 47.5 and 52.5. Thus a relatively minor change in your process will show up as a change in the Rolling Average, and when a limit is exceeded, will cause the Rolling Average LED on the front panel to blink, Red for Upper Limit excursion and Yellow for Lower Limit excursion.

[2/14] ROLLING AVERAGE UPPER LIMIT

R	A		U	P	R	.	L	I	M	I	T	5	2	.	5	7	5
																5	0
																2	5
2	/	1	4														

Keystrokes: UP/DOWN, NEXT, UP/DOWN, NEXT, NEXT, UP/DOWN, (range 00.0 - 99.9) ENTER.

Do not set UPPER LIMIT lower than LOWER LIMIT!

The Rolling Average Upper Limit sets the limit of excursion of the Rolling Average above the nominal centerline value (normally 50.0). Centerline value is adjusted at [2/10] ADJUST CALIBRATION. When the Rolling Average Display [2/16] is enabled, the Rolling Average Front Panel LED will change to a blinking Red signal whenever the Upper limit is exceeded.

3.2.15

[2/15] ROLLING AVERAGE LOWER LIMIT

R	A		L	W	R	.	L	I	M	I	T					7	5
																5	0
												4	7	.	5	2	5
2	/	1	5														

Keystrokes: UP/DOWN, NEXT, UP/DOWN, NEXT, NEXT, UP/DOWN (Range 00.0 - 99.9), ENTER

Do not set UPPER LIMIT lower than LOWER LIMIT!

The Rolling Average Lower Limit sets the limit of excursion of the Rolling Average below the nominal centerline value (normally 50.0). Centerline value is adjusted at [2/10] ADJUST CALIBRATION. When the Rolling Average Display [2/16] is enabled, the Rolling Average Front Panel LED will change to a blinking Yellow signal whenever the limit is exceeded.

3.2.16

[2/16] ROLLING AVERAGE DISPLAY ENABLE

S	H	O	W			R	A	=	Y	E	S	?		5	2	.	5		7	5
Y	E	S												#	#	.	#		5	0
														4	7	.	5		2	5
2	/	1	6											5	2	.	6		9	4

Keystrokes: UP, UP, ENTER

To enable the Rolling Average function, toggle to YES and Enter. The Rolling Average will begin to accumulate container ADR values, the Rolling Average LED will turn from Red (Rolling Average off) to solid Yellow, until the full sample has been accumulated. When the 256 container sample has accumulated and averaged, the LED color will change to solid Green if within limits, blinking Yellow if below limits and blinking Red if above limits, and the Rolling Average Display will change from ### to a numeric display.

When Rolling Average is active, the most recent out-of-limits maximum value is displayed below the Lower Limit setting display (52.6 in the example above), and will remain displayed until it is displaced by a later excursion.

3.2.17

[2/17] ENABLE ROLLING AVERAGE AUTO-RECALIBRATION

Rolling Average Auto-Recalibration recognizes a sudden change in ADR readings caused by an event such as a change in can ends, and recalibrates the unit to accommodate that change. This is accomplished by taking a small number of ADR readings, averaging those readings, and comparing that average to the 256 can rolling average. If an event occurs (such as a new manufacturer's can ends applied) which causes a major shift in ADR readings, that will cause the short average to change to the new ADR readings quickly, while the rolling average will be much slower to change. When the difference between the short average and the rolling average exceeds a threshold amount, then the ADR-50D will automatically recalibrate to bring the rolling average back within the Upper and Lower Rolling Average Limits.

Be extremely careful when implementing this function. It can bite you. If you were to suddenly introduce cold water into your cans instead of product, the ADR-50D would recalibrate with only a few cans rejected before recalibrating and proceeding as if all was normal.

To Enable this function, press UP to toggle the query to YES, then press ENTER.

IF PASSWORD SECURITY IS INSTALLED, SUPERVISOR'S
PASSWORD IS REQUIRED TO SAVE OR CHANGE ANY DATA ON
THIS MENU SELECTION. SEE PARAGRAPH 3.6.1

R	A		C	A	L	=	Y	E	S	?	5	2	.	5		7	5
Y	E	S									#	#	.	#		5	0
											4	7	.	5		2	5
2	/	1	7													9	4

Keystrokes: UP, UP, ENTER

IMPORTANT - To bring up Menus **[2/18]** to **[2/20]**, you must press ENTER two times at menu **[2/17]**. These menus are necessary to implement Rolling Average Auto-Calibration.

3.2.18

[2/18] SHORT AVERAGE SIZE

S	H	R	T	L	R	A	V		S	I	Z	5	2	.	5		7	5
1	6											#	#	.	#		5	0
												4	7	.	5		2	5
2	/	1	8														9	4

Keystrokes: UP, UP, ENTER

Value toggles through 04,08,16 and 32.

This screen selects the number of containers in the short average. Normal practice suggests that a 16 container sample provides the best, most stable and fastest response.

3.2.19 [2/19] ROLLING AVERAGE THRESHOLD SET

R	A			T	H	R	E	S	H	O	L	D		5	2	.	5		7	5
0	8													#	#	.	#		5	0
														4	7	.	5		2	5
2	/	1	9																9	4

Keystrokes: UP, UP, ENTER

Value toggles through 04, 08, 16 and 32.

This screen selects the amount the Short Average must diverge from the Rolling Average to trigger the Rolling Average Auto-Recalibrate process. Experience suggests that if a value of 16 is selected for Short Average size, 08 is a good Threshold selection, or 32 Short Average and 16 Threshold.

3.2.20 [2/20] SHORT AVERAGE MINIMUM DEVIATION

R	A			C	A	L		M	I	N		=		5	2	.	5		7	5
3														#	#	.	#		5	0
														4	7	.	5		2	5
2	/	2	0																9	4

Keystrokes: UP, UP, ENTER

This screen has values of 1 through 8.

The Minimum deviation determines when the unit satisfies the Auto-Calibration requirement. At a setting of 3, when the Short Average is within 3 of the Rolling Average, and maintains within 3, that is judged to be within bounds. The ADR-50D resumes normal operation.

Best results seem to be achieved with a setting of 2 or 3 for the Short Average Minimum Deviation.

3.2.21 [2/21] NOT USED

3.2.22 [2/22] NOT USED

3.2.24 [2/23] NOT USED

[2/25] SAVE CONTAINER DATA

S	A	V	E		C	O	N	T	N	R	#		5	2	.	5		7	5
1	8												5	0	.	3		5	0
													4	7	.	5		2	5
2	/	2	5										5	2	.	6		9	4

Keystrokes: UP/DOWN, NEXT, UP/DOWN (Range 00 - 99), ENTER

IF PASSWORD SECURITY IS INSTALLED, SUPERVISOR'S
PASSWORD IS REQUIRED TO SAVE OR CHANGE ANY DATA ON
THIS MENU SELECTION. SEE PARAGRAPH 3.6.1

To save the data you have entered in the menu selections above, press ENTER. This menu selection will default to the container number set in **[2/01]**, so you will normally only press ENTER. Be absolutely certain that you have the correct container number assigned on the display, since you will cause the data to be stored in that file, regardless of whether or not another container is stored there.

If you want to create a new container number by altering an existing container's data, Enter the new container number and press ENTER. Example: You run corn in a #10 can. This is entered as Container #22. You receive can ends from a different supplier. When running those can ends, the Calibration level **[2/04]** changes from 128 to 141. All other variables you have entered into Menu 2 remain the same. You can go to can #22, change the calibration level from 128 to 141 and then Save **[2/12]** that as container #33. You can then run your #10 cans of corn as either Container #22 or Container #33, depending on which supplier's end is used.

3.3

MENU 3 - COUNTERS MENU

The ADR-50DR incorporates three counters. The total container count is a count of every container that enters the ADR. The Net container count is the total container count minus total rejects, and reject count is total rejects detected. Total and Net counts cannot be displayed simultaneously. Either Total or Net count will be displayed in the seven-digit display area. If the rejector is disabled, any rejects detected will be counted, even if the container was not rejected from the line. All counters accumulate count when containers are running, even if the count is not displayed.

3.3.1 [3/01] COUNTERS DISPLAY ENABLE

S	H	O	W		C	N	T		=	Y	?						7	5
Y	E	S															5	0
					0	0	0	0	0	0	0						2	5
3	/	0	1														9	4

Keystrokes: UP, ENTER

Menu **[3/01]** switches between YES and NO when the UP key is pressed. Press ENTER when the response you want is displayed. No count numbers are displayed when NO, Both count numbers are displayed when YES.

3.3.2 [3/02] SHOW NET COUNT

S	H	O	W		N	E	T		=	Y	?						7	5
Y	E	S															5	0
					N	E	T	-	0	0	0	0	0	0	0		2	5
3	/	0	2														9	4

Keystrokes: UP, ENTER

Menu **[3/02]** switches between YES and NO when the UP key is pressed. Press ENTER when the response you want is displayed. Net count is displayed at YES, gross count is displayed at NO.

3.3.3 [3/03] CLEAR ALL COUNTERS

C	L	R	.	A	L	L	C	N	T	S							7	5
																	5	0
		N	E	T	-	0	2	6	9	2	3	4					2	5
3	/	0	3					0	0	0	1	8					9	4

Keystroke: ENTER

This is a passive screen. To clear all three counters, select Menu **[3/03]** and press ENTER. This will clear all counters, even if not displayed.

3.3.4 [3/04] CLEAR TOTAL CONTAINER COUNT

C	L	R		T	O	T	C	N	T								7	5
																	5	0
				0	2	6	9	2	5	2							2	5
3	/	0	4					0	0	0	1	8					9	4

Keystroke: ENTER

This is a passive screen. To clear Total Count, select Menu **[3/04]** and press ENTER. Total Count will clear, even if not displayed.

3.3.5 CLEAR NET CONTAINER COUNT

C	L	R		N	E	T	C	N	T								7	5
																	5	0
				0	2	6	9	2	5	2							2	5
3	/	0	5					0	0	0	1	8					9	4

Keystroke: ENTER

This is a passive screen. To clear Net count, select Menu **[3/05]** and press ENTER. Net Count will clear, even if not displayed.

3.3.6

[3/06] CLEAR REJECTED CONTAINER COUNT

C	L	R		R	E	J		C	N	T							7	5
																	5	0
				0	2	6	9	2	5	2							2	5
3	/	0	6				0	0	0	1	8						9	4

Keystroke: ENTER

This is a passive screen. To clear Rejects count, select menu **[3/06]** and press ENTER. Reject Count will clear, even if not displayed.

3.4

MENU 4 - COMMUNICATIONS PORT

The communications port is an RS-232 port, transmitting ADR data through J-2, labeled COMM PORT, at the back of the waterproof enclosure. This is not a two-way communications port, but transmit only.

The communications port transmits the following data:

1. Good Container Lid Deflection
2. Bad Container Lid Deflection
(And, if selected)
3. Rolling Average
4. Out-Of-Limits Rolling Average

See Addendum 1 for Technical Information regarding the makeup of the Data Packets and the RS-232 protocol for connection to the Communications Port.

3.4.1

[4/01] ACTIVATE COMMUNICATIONS PORT

R	S	2	3	2		O	N	=	Y	?			5	2	.	5		7	5
Y	E	S											4	9	.	6		5	0
						0	2	6	9	2	5	2	4	7	.	5		2	5
4	/	0	1					0	0	0	1	8	5	6	.	1		9	4

Keystrokes: UP, UP, ENTER

This screen turns the RS-232 Port ON or OFF. If NO is selected, no RS-232 signal is transmitted, and the screen 3.4.2 below is inactive.

3.4.2

[4/02] ROLLING AVERAGE TRANSMIT

S	E	N	D		R	A	V	=	Y	?		5	2	.	5		7	5
Y	E	S										4	9	.	9		5	0
					0	2	6	9	2	5	2	4	7	.	5		2	5
4	/	0	2				0	0	0	1	8	5	6	.	1		9	4

Keystrokes: UP, UP, ENTER.

This screen enables transmission of Rolling Average information as well as ADR numbers, when Communications Function is active.

MENU 5 - PROGRAMMABLE ALARMS/CONTROLS

The ADR-50DPC Programmable Alarms/Controls menu presents the selection of control functions programmed for the ADR-50D.

Note that some of these functions are a purchased option, (Menus [5/07] - [5/30]).

There are seven functions currently available:

1. Rolling Average Out Of Upper Limit - When the Rolling Average Upper Limit is exceeded, an alarm condition occurs. **[5/01]**
2. Rolling Average Out Of Lower Limit - When the Rolling Average Lower Limit is exceeded, an alarm condition occurs. **[5/04]**
3. "J" Consecutive Rejects - When the maximum number of containers (J) are rejected consecutively, an alarm condition occurs. **[5/07]**
4. "X" Rejects in "Y" Containers - When the maximum number of rejects (X) occur in the last (Y) number of containers, an alarm condition occurs. **[5/11]**
5. "S" Rejects in "T" Minutes - When the maximum number of rejects (S) occur within the last (T) minutes, an alarm condition occurs. **[5/16]**
6. Every "Pth" Container, "Q" Times - When every "Pth" (6th for example) container is rejected, (Q) times in a row, an alarm condition occurs. P could be set to 6 if you had a six head closing machine, which would alert you to a defective seaming roll, if an alarm occurred. **[5/21]**
7. Terminal Count "N" - Set to alarm at a predetermined count. **[5/26]**

<p>You are invited to contact our engineering department to discuss a custom alarm program.</p>	<p>1-410-754-5714</p>
---	-----------------------

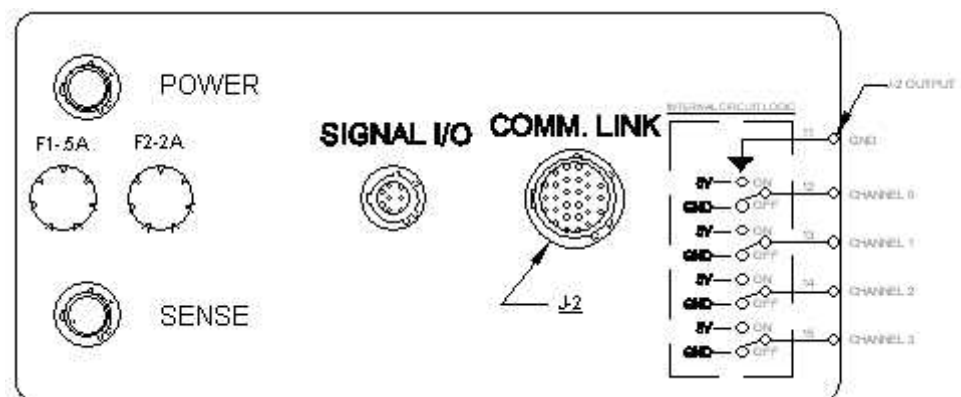
When an alarm condition occurs, a logic level signal occurs at the COMM LINK Connector (See Figure 3-1). This signal can be fed to the Food Instrument Corporation optional accessory AIC-110 Alarm Indicator/Controller, or to an external controller. These signals can be used to operate an audible or visible alarm, or to switch a motor starter, can stop etc.

This Menu is unique, in that if any function is not made active, then the Menu selections to set other parameters of that function are not displayed.

If one of the primary selections (01,04,07,11,16,21,26) is chosen, it is followed by the screens required for programming that function.

The first screen following, (OFF,1=.5,2=1), disables (-0), selects a 5 volt 50 millisecond output pulse (-1), or a 5 volt 100 millisecond pulse (-2). When a programmed event occurs, the selected output pulse appears at the COMM LINK Connector at the back of the waterproof enclosure (Figure 3.1). When used with the FOOD INSTRUMENT CORPORATION AIC-110 Alarm Indicator/Controller, the 50 millisecond pulse will cause a momentary contact closure at the AIC-110, while the 100 millisecond pulse will cause a latched contact closure that can only be released with the reset button.

The second screen following, (OUTPUT CHAN.), selects one of four available output channels, channel 0, 1, 2 or 3. This screen directs the output pulse to the selected channel, and to the input channel of the AIC-110. More than one function can be assigned to the same output channel. For example, both Rolling Average Upper Limit Alarm and Rolling Average Lower Limit Alarm could be selected to Channel 0. Then, if either an Upper Limit or Lower Limit Alarm occurred, either condition would activate Channel 0.



COUNTERS OUTPUT
Figure 3.1

3.5.1

[5/01] ROLLING AVERAGE UPPER LIMIT ALARM

>R	A	U	-	L	I	M	=	Y	?			5	2	.	5		7	5
Y	E	S										5	2	.	7		5	0
												4	7	.	5		2	5
5	/	0	1									5	2	.	8		9	6

Keystrokes: UP, UP, ENTER

This screen turns the Rolling Average Upper Limit Alarm function On or Off. Pressing the UP key toggles the display from YES to NO. ENTER must be pressed to make selection.

3.5.2

[5/02] ROLLING AVERAGE UPPER LIMIT ALARM ENABLE

O	F	F	,	1	=	.	5	,	2	=	1					5	2	.	5		7	5
2																5	2	.	7		5	0
																4	7	.	5		2	5
5	/	0	2													5	2	.	8		9	6

Keystrokes: UP, UP, ENTER

This menu has three selections; O(FF), 1 or 2. If 1 is selected, the logic level output signal is 50 milliseconds at +5 volts. If 2 is selected, the logic level output signal is 100 milliseconds at +5 volts.

If 1 is selected, the AIC-110 will switch the selected output ON upon sensing a 50 millisecond pulse, and remain on for 50 milliseconds. Once reset, the AIC-110 output will remain off until the Rolling Average drops below the Upper Limit, and then rises above the Upper Limit again.

Upon sensing a 100 millisecond pulse, the AIC-110 will switch the output ON and latch ON until manually reset. It will not drop out if the Alarm condition ceases.

3.5.3 [5/03] ALARM OUTPUT CHANNEL SELECT

O	U	T	P	U	T	C	H	A	N	.	5	2	.	5	7	5
2											5	2	.	7	5	0
											4	7	.	5	2	5
5	/	0	3								5	2	.	8	9	6

Keystrokes: UP, UP, ENTER

This screen selects the output channel for the Alarm signal. Four channels are available, 0,1,2 and 3. More than one Alarm signal can be assigned to any channel. You can program both the Upper Limit and Lower Limit Rolling Average Alarm to channel 0, and if either limit is exceeded, that channel will be activated.

3.5.4 [5/04] ROLLING AVERAGE LOWER LIMIT ALARM

<	R	A	L	-	L	I	M	=	Y	?	5	2	.	5	7	5
NO											5	2	.	7	5	0
											4	7	.	5	2	5
5	/	0	4								5	2	.	8	9	6

Keystrokes: UP, UP, ENTER

This screen turns the Rolling Average Lower Limit Alarm function On or Off. Pressing the UP key toggles the display from YES to NO. ENTER must be pressed to make selection.

3.5.5 [5/05] ROLLING AVERAGE LOWER LIMIT ALARM ENABLE

O	F	F	,	1	=	.	5	,	2	=	1	5	2	.	5	7	5
2												5	2	.	7	5	0
												4	7	.	5	2	5
5	/	0	5									5	2	.	8	9	6

Keystrokes: UP, UP, ENTER

Same as 3.5.2 above.

3.5.6

[5/06] ALARM OUTPUT CHANNEL SELECT

O	U	T	P	U	T	C	H	A	N	.	5	2	.	5	7	5
2											5	2	.	7	5	0
											4	7	.	5	2	5
5	/	0	6								5	2	.	8	9	6

Keystrokes: UP, UP, ENTER

Same as 3.5.3 above.

NOTE:

Menus **[5/07] - [5/30]** are functions that are purchased options. To activate these menus please contact your Representative or contact us at Food Instrument Corporation.

3.5.7 [5/07] J IN A ROW REJECTS

J		I	N		R	O	W		=	Y	?		5	2	.	5		7	5
Y	E	S											5	2	.	7		5	0
													4	7	.	5		2	5
5	/	0	7										5	2	.	8		9	6

Keystrokes: UP, UP, ENTER

This screen selects or deselects the "J" Rejects in a row function.

3.5.8 [5/08] J IN A ROW REJECTS ALARM ENABLE

O	F	F	,	1	=	.	5	,	2	=	1		5	2	.	5		7	5
2													5	2	.	7		5	0
													4	7	.	5		2	5
5	/	0	8										5	2	.	8		9	6

Keystrokes: UP, UP, UP ENTER

Same as 3.5.2

3.5.9 [5/09] ALARM OUTPUT CHANNEL SELECT

O	U	T	P	U	T		C	H	A	N	.		5	2	.	5		7	5
2													5	2	.	7		5	0
													4	7	.	5		2	5
5	/	0	9										5	2	.	8		9	6

Keystrokes: UP, UP, ENTER

Same as 3.5.3

3.5.10 [5/10] SET VALUE OF J

V	A	L	U	E		O	F		J	?			5	2	.	5		7	5
1	7												5	2	.	7		5	0
													4	7	.	5		2	5
5	/	1	0										5	2	.	8		9	6

Keystrokes: UP, UP, NEXT, UP, UP, ENTER

Selects a value for "J" consecutive rejects; range 2 - 32.

3.5.11 [5/11] "X" REJECTS IN "Y" CONTAINERS

X		I	N		Y		=	Y	E	S	?		5	2	.	5		7	5
Y	E	S											5	2	.	7		5	0
													4	7	.	5		2	5
5	/	1	1										5	2	.	8		9	6

Keystrokes: UP, UP, ENTER

This screen turns the X Rejects in Y Containers function On or Off. Pressing the UP key toggles the display from YES to NO. ENTER must be pressed to make selection.

3.5.12 [5/12] "X" IN "Y" ALARM ENABLE

	O	F	F	,	1	=	.	5	,	2	=	1		5	2	.	5		7	5
2														5	2	.	7		5	0
														4	7	.	5		2	5
5	/	1	2											5	2	.	8		9	6

Keystrokes: UP, UP, UP ENTER

Same as 3.5.2

3.5.13 [5/13] ALARM OUTPUT CHANNEL SELECT

	O	U	T	P	U	T		C	H	A	N	.		5	2	.	5		7	5
2														5	2	.	7		5	0
														4	7	.	5		2	5
5	/	1	3											5	2	.	8		9	6

Keystrokes: UP, UP, ENTER

Same as 3.5.3

3.5.14 [5/14] SET THE VALUE OF "X" REJECTS

V	A	L	U	E		O	F		X	?			5	2	.	5		7	5
7	7												5	2	.	7		5	0
													4	7	.	5		2	5
5	/	1	4										5	2	.	8		9	6

Keystrokes: UP, UP, NEXT, UP, UP, ENTER

This screen sets the number of rejects in a given sample size that will cause an alarm. Range, 1 to 99.

3.5.15 [5/15] SET THE VALUE OF "Y" NUMBER OF CONTAINERS

V	A	L	U	E		O	F		Y	?			5	2	.	5		7	5
7													5	2	.	7		5	0
													4	7	.	5		2	5
5	/	1	4										5	2	.	8		9	6

Keystrokes: UP, UP, NEXT, UP, UP, NEXT, UP, UP, NEXT, UP, UP, ENTER

This screen sets the value of "Y", determining the number of containers in which "X" rejects will cause an alarm. Range, 10 to 9000.

3.5.16 [5/16] "S" REJECTS IN "T" MINUTES ALARM.

S		I	N		T	=	Y	E	S	?			5	2	.	5		7	5
Y	E	S											5	2	.	7		5	0
													4	7	.	5		2	5
5	/	1	6										5	2	.	8		9	6

Keystrokes: UP, UP, ENTER

This screen turns the "S" Rejects in "T" Minutes function On or Off. Pressing the UP key toggles the display from YES to NO. ENTER must be pressed to make selection.

3.5.17 **[5/17] "S" REJECTS IN "T" MINUTES ALARM ENABLE**

O	F	F	,	1	=	.	5	,	2	=	1		5	2	.	5		7	5
2													5	2	.	7		5	0
													4	7	.	5		2	5
5	/	1	7										5	2	.	8		9	6

Keystrokes: UP, UP, UP ENTER

Same as 3.5.2

3.5.18 **[5/18] "S" REJECTS IN "T" MINUTES ALARM OUTPUT CHANNEL SELECTOR**

O	U	T	P	U	T		C	H	A	N	.		5	2	.	5		7	5
2													5	2	.	7		5	0
													4	7	.	5		2	5
5	/	1	8										5	2	.	8		9	6

Keystrokes: UP, UP, ENTER

Same as 3.5.3

3.5.19 **[5/19] SET VALUE OF "S" REJECTS**

V	A	L	U	E		O	F		S	?			5	2	.	5		7	5
1	5												5	2	.	7		5	0
													4	7	.	5		2	5
5	/	1	9										5	2	.	8		9	6

Keystrokes: UP, UP, NEXT, UP, UP, ENTER

This screen sets the number of REJECTS, range 2 to 30.

3.5.20 [5/20] SET VALUE OF "T" MINUTES

V	A	L	U	E		O	F		T	?					5	2	.	5		7	5
3	0														5	2	.	7		5	0
															4	7	.	5		2	5
5	/	2	0												5	2	.	8		9	6

Keystrokes: UP, UP, NEXT, UP, UP, ENTER

This screen sets the number of minutes of test period. Range 1 to 30 minutes.

3.5.21 [5/21] EVERY "Pth" CONTAINER, "Q" TIMES

1	o	f	P	/	Q	=	Y	E	S	?					5	2	.	5		7	5
Y	E	S													5	2	.	7		5	0
															4	7	.	5		2	5
5	/	2	1												5	2	.	8		9	6

Keystrokes: UP, UP, ENTER

This screen turns the Every "Pth" Container function On or Off. Pressing the UP key toggles the display from YES to NO. ENTER must be pressed to make selection.

3.5.22 [5/22] EVERY "Pth" CONTAINER ALARM ENABLE

O	F	F	,	1	=	.	5	,	2	=	1				5	2	.	5		7	5
2															5	2	.	7		5	0
															4	7	.	5		2	5
5	/	2	2												5	2	.	8		9	6

Keystrokes: UP, UP, ENTER

Same as 3.5.2

3.5.23 **[5/23]** EVERY "Pth" CONTAINER ALARM OUTPUT CHANNEL
SELECTOR

O	U	T	P	U	T		C	H	A	N	.		5	2	.	5		7	5
2													5	2	.	7		5	0
													4	7	.	5		2	5
5	/	2	3										5	2	.	8		9	6

Keystrokes: UP, UP, UP, ENTER

Same as 3.5.3

3.5.24 **[5/24]** SET VALUE OF "P"

V	A	L	U	E		O	F		P	?			5	2	.	5		7	5
0	6												5	2	.	7		5	0
													4	7	.	5		2	5
5	/	2	4										5	2	.	8		9	6

Keystrokes: UP, UP, NEXT, UP, UP, ENTER

Set the number of containers in the cycle. Range 2 to 99

3.5.25 **[5/25]** SET VALUE OF "Q"

V	A	L	U	E		O	F		Q	?			5	2	.	5		7	5
3	0												5	2	.	7		5	0
													4	7	.	5		2	5
5	/	2	5										5	2	.	8		9	6

Keystrokes: UP, UP, NEXT, UP, UP, ENTER

This screen sets the number of repetitions to trigger an alarm. Range 2 to 30

3.5.26 [5/26] ALARM AT PREDETERMINED COUNT

T	E	R	M			C	N	T		=	Y	?		5	2	.	5		7	5
Y	E	S												5	2	.	7		5	0
														4	7	.	5		2	5
5	/	2	6											5	2	.	8		9	6

Keystrokes: UP, UP, ENTER

This screen Enables or Disables Alarm At Predetermined count. When enabled, it will alarm when the total count that you have programmed is reached.

3.5.27 [5/27] PREDETERMINED COUNT ALARM ENABLE

O	F	F	,	1	=	.	5	,	2	=	1			5	2	.	5		7	5
2														5	2	.	7		5	0
														4	7	.	5		2	5
5	/	2	7											5	2	.	8		9	6

Keystrokes: UP, UP, ENTER

Same as 3.5.2

3.5.28 [5/28] PREDETERMINED COUNT CHANNEL SELECTOR

O	U	T	P	U	T			C	H	A	N	.		5	2	.	5		7	5
2														5	2	.	7		5	0
														4	7	.	5		2	5
5	/	2	8											5	2	.	8		9	6

Keystrokes: UP, UP, ENTER

Same as 3.5.3

3.5.29 [5/29] SET PREDETERMINED COUNT "N"

V	A	L	U	E		O	F		N	?				5	2	.	5		7	5
0	0	6	0	0	0	0								5	2	.	7		5	0
														4	7	.	5		2	5
5	/	2	9											5	2	.	8		9	6

Keystrokes: UP, UP, NEXT, UP,.....NEXT, UP, UP, ENTER

This screen sets the number of containers at which the alarm triggers.

3.5.30 [5/30] DISPLAY CURRENT VALUE OF "N"

S	T	A	T	I	C		T	-	C	N	T			5	2	.	5		7	5
0	0	5	9	9	9	9								5	2	.	7		5	0
														4	7	.	5		2	5
5	/	3	0											5	2	.	8		9	6

Keystrokes: None

When selected, Menu [5/30] displays the count remaining before the alarm triggers.

3.6

MENU 6 PASSWORD ENTRY

Menu 6 consists of one selection only. This Menu will not be displayed if the PASSWORD system is disabled. When the PASSWORD system is active, you must enter your password in this menu before you can change any parameter in the system, except to adjust the Contrast or to Enable or Disable the Rejector from the front panel. It will be necessary to use the Supervisor's Password to alter or make a change on some Menu Selections. These Menus will be identified in the Instruction Manual with the following box:

IF PASSWORD SECURITY IS INVOKED, SUPERVISOR'S PASSWORD IS REQUIRED TO SAVE OR CHANGE ANY DATA ON THIS MENU SELECTION. SEE PARAGRAPH 3.6.1

3.6.1

[6/01] ENTER PASSWORD FOR ACCESS

P	A	S	S	W	O	R	D		?	?	?									7	5
0	0	0	0						S	/	A									5	6
																				2	5
6	/	0	1																		

Keystrokes: UP/DOWN, NEXT, UP/DOWN, NEXT, UP/DOWN, NEXT, UP/DOWN, ENTER

When a correct Password has been entered, the "A" of the **S/A** will appear, indicating that the Password has been accepted. You will be able to alter the ADR-50D settings until the Password Time expires. When the time expires, you must re-enter your Password at **Menu [6/01]** to continue. You can cancel your Password entry at any time by recalling **Menu [6/01]** and pressing the CLEAR button.

To gain access to **Menu 7** when password security is invoked, after entering the supervisor's password at **Menu [6/01]** you must press the Menu key.

MENU 7 PASSWORD CONTROL/ENABLE

IF PASSWORD SECURITY IS INVOKED, SUPERVISOR'S
PASSWORD IS REQUIRED TO SAVE OR CHANGE ANY DATA ON
THIS MENU SELECTION. SEE PARAGRAPH 3.6.1

This Menu allows you to invoke the Password system, install up to three different passwords (numerical values 0001 - 9999) and to set the length of time after the Password has been accepted before the system stops accepting entries. The ADR-50D is shipped with passwords set as follows:

Supervisor's Password (#1)	1000
Password number 2	2000
Password number 3	3000

The first Menu, **[7/01]**, controls the Supervisor's Password, Password #1. This Password, in addition to allowing access to all Password protected functions, allows changing of passwords, invoking or disabling Password Protection and setting the length of time a password will allow changes before the system becomes secure again. Passwords 2 and 3 are available on Menus **[7/02]** and **[7/03]** respectively. Only the Supervisor's Password can gain access to any selection on Menu 7.

To the right of the Password Display is a two-part message, **S/A**. The **S** indicates that the Password Security is ON. When this message is displayed, Password Security is active and no one can make any adjustment to any ADR parameters without entering a valid password. When the **S** is absent, security has not been invoked and anyone can make adjustments to the ADR-50D. **MENU 6** will not appear. The **A** indicates that the Password has been ACCEPTED and that authorized personnel can make changes to the system.

[7/01] SET SUPERVISOR'S PASSWORD

IF PASSWORD SECURITY IS INVOKED, SUPERVISOR'S
PASSWORD IS REQUIRED TO SAVE OR CHANGE ANY DATA ON
THIS MENU SELECTION. SEE PARAGRAPH 3.6.1

[illegible]

Keystrokes: UP/DOWN, NEXT, UP/DOWN, NEXT, UP/DOWN, NEXT, UP/DOWN, ENTER

To change the Supervisor's password, the current Supervisor's password must be entered at **Menu [6/01]** to gain access to this menu. Once accessed, the Password can be set to any value between 0001 and 9999. Do not select 0000 as a password. **Menu [6/01]** always starts at 0000. If you use 0000 as your password, then every time Menu 6 is selected, it will recognize 0000 as a valid password and open the system to change. Until Password Security is turned ON **Menu [7/05]**, anyone can change passwords or system parameters.

3.7.2

MENU [7/02] SET PASSWORD 2

IF PASSWORD SECURITY IS INVOKED, SUPERVISOR'S
PASSWORD IS REQUIRED TO SAVE OR CHANGE ANY DATA ON
THIS MENU SELECTION. SEE PARAGRAPH 3.6.1

[illegible]

Keystrokes: UP/DOWN, NEXT, UP/DOWN, NEXT, UP/DOWN, NEXT, UP/DOWN, ENTER

To change Password 2, insert any value between 0001 and 9999 (see above), then ENTER.

3.7.3 MENU [7/03] SET PASSWORD 3

IF PASSWORD SECURITY IS INVOKED, SUPERVISOR'S
PASSWORD IS REQUIRED TO SAVE OR CHANGE ANY DATA ON
THIS MENU SELECTION. SEE PARAGRAPH 3.6.1

[illegible]

Keystrokes: UP/DOWN, NEXT, UP/DOWN, NEXT, UP/DOWN, NEXT, UP/DOWN, ENTER

To change Password 3, insert any value between 0001 and 9999 (see above), then ENTER.

3.7.4 Menu [7/04] SET PASSWORD TIME ON/OFF

IF PASSWORD SECURITY IS INVOKED, SUPERVISOR'S
PASSWORD IS REQUIRED TO SAVE OR CHANGE ANY DATA ON
THIS MENU SELECTION. SEE PARAGRAPH 3.6.1

[illegible]

Keystrokes: UP/DOWN, NEXT, UP/DOWN (Range 01 - 15 minutes),
ENTER

When Password Security is enabled, the Password Timer is started when a valid Password is entered. Access to secure menus is allowed until the Password times out or until the Password is CLEARED at Menu **[6/01]**. With this Menu, **[7/04]**, that time can be set between 1 minute and 15 minutes. After entering the Supervisor's Password at Menu **[6/01]**, enter the Maximum length of time you want the Password active in this menu and then press ENTER to store it in memory.

[7/05] ENABLE/DISABLE PASSWORD SECURITY

IF PASSWORD SECURITY IS INVOKED, SUPERVISOR'S
PASSWORD IS REQUIRED TO SAVE OR CHANGE ANY DATA ON
THIS MENU SELECTION. SEE PARAGRAPH 3.6.1

[illegible]

Keystrokes: UP, UP, ENTER

This menu ENABLES or DISABLES the password security system. By pressing the UP key you can switch between YES and NO in the highlighted block on the display. Select the proper response and press ENTER.

PAGES 3-46 to 3-48

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3.9 MENU 9 SYSTEM TESTS

This Menu provides tests for the bench technician when troubleshooting the ADR-50D. None of these Menu Selections is used during operation of the ADR-50D. These pages are provided for information purposes only.

3.9.1 [9/01] STATIC TEST

S	T	A	T	I	C	T	E	S	T								7	5
																	5	0
																	2	5
9	/	0	1														8	1

Keystrokes: NEXT

This Menu Selection tests the operation of the ADR-50D when the conveyor is not running, or the unit is being checked on the bench. When a container is placed under the probe with the conveyor NOT running, when you press NEXT the ADR reading for that container will appear where "50" shows above. By repeatedly pressing NEXT, you can observe the stability of the ADR readings.

3.9.2 [9/02] ROM (Read Only Memory) REVISION NUMBER

R	O	M	#		1	1	0	2	1	Q	6						7	5
																	5	0
																	2	5
9	/	0	2														8	1

Keystrokes: None

Menu Selection [9/02] is a passive screen. The number displayed is that of the installed version of the ROM in this unit. When a new ROM is installed, this number will change to reflect the current version installed.

3.9.3 [9/03] PROBE TEST

P	R	O	B	E		T	S	T	=	Y	?						7	5
Y																	0	0
																	2	5
9	/	0	3														8	1

Keystrokes: UP, UP, ENTER

This menu selection provides an active test of the SENSE Probe. To Activate the Probe Test selection, toggle to "Y". After completion of the probe test, you MUST reset the screen to "N".

With no container under the Sense Probe, pass your finger between the Light Source and Photosensor to break the infra-red light beam. This should produce an ADR reading of 00. Any reading other than 00 indicates an out-of-balance probe. The probe set must be replaced.

When a container is passed under the probe, an ADR reading of 99 should be produced. This indicates that the probe is working and is sufficiently sensitive for the cans under test. After completion of the probe test, you MUST reset the screen to "N".

3.9.4 [9/04] CLEAR RAM

R	A	M		C	L	R		T	S	T							7	5
																	5	0
																	2	5
9	/	0	4														8	1

Keystrokes: None

This screen is part of a Bench Test and Setup procedure at installation of a new ROM. It is not user accessible.

3.9.5

[9/05] DAS PULSE TRAIN ENABLE

P	U	L	S	E	S	O	N	=	Y	?							7	5
N																	5	0
																	2	5
9	/	0	5														8	1

Keystrokes: UP, UP, ENTER

This Menu Selection enables a test signal for a bench test. Selecting "Y" will have no effect on operation, except to possibly slow down signal processing. It should be left at "N".

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4 ADR-50DB TROUBLESHOOTING GUIDE

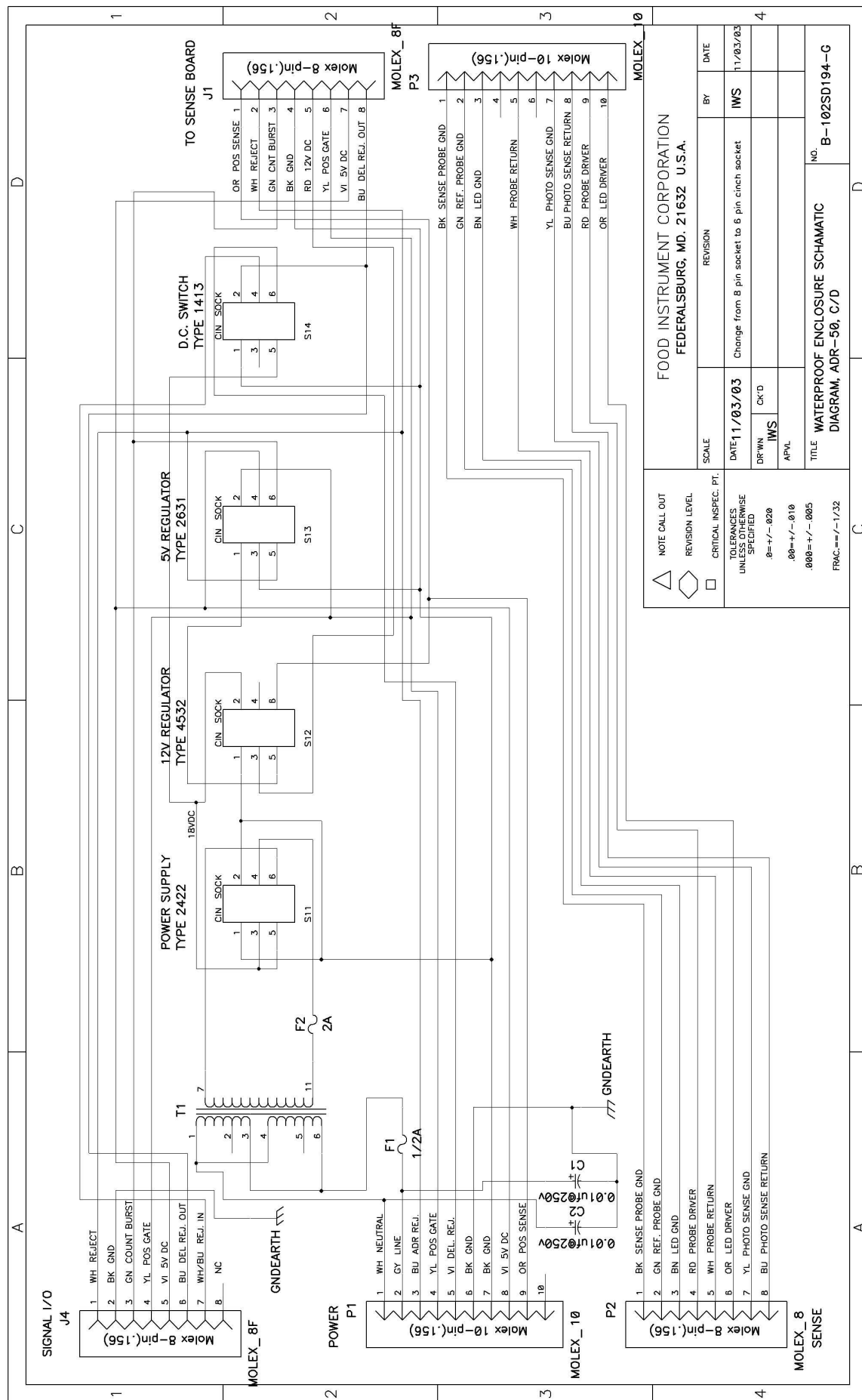
4.0	PRIMARY POWER TROUBLESHOOTING	
	<u>NOTE:</u>	<p>Insure that a single ground wire goes back to the electrical panel.</p> <p>Insure that the ADR-50D <u>is not</u> connected to <u>any</u> motor supply voltages.</p> <p>Insure that the ADR-50D is connected directly to the AC power source through a panel breaker.</p>
	4.0.1	Check for a tripped breaker or a bad fuse in breaker panel.
	4.0.2	Check AC power input for water in connectors, frayed wires, or broken wires.

4.1	AC POWER SUPPLY TROUBLESHOOTING (Fuses blow when AC Power is applied)	
	<u>CAUTION:</u>	DO NOT APPLY AC POWER AT THIS TIME.
	4.1.1	Remove 10 front panel screws using 7/64" Allen Wrench in spare parts kit.
	4.1.2	Separate amplifier assembly (front panel and attached circuit boards) from waterproof enclosure.
	4.1.3	Unplug three cable connections on back of circuit board and set amplifier assembly aside.
	4.1.4	Remove Power Supply Module, DC Switch Module, and 12V Regulator Module.
	4.1.5	Ground common lead of VOM meter to waterproof enclosure and set VOM to measure 200 K OHMS.
	4.1.6	Measure Pin 3 of the Power Supply socket. If infinite resistance is not measured, remove 6 sub-chassis screws, and inspect the broken or frayed wires and repair as needed.
	4.1.7	<p>Measure Pin 5 of 12 V Regulator socket.</p> <p>If meter measures 0 OHMS, replace 5 V Regulator Module with a good 5 V Regulator from Spare Parts Kit.</p>
	4.1.8	Reinstall 12 V Regulator Module.
	4.1.9	<p>Measure Pin 3 of Power Supply socket.</p> <p>If meter measures 0 OHMS, replace 12 V Regulator Module with a good 12 V Regulator from Spare Parts Kit.</p>

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4.1.10	Reinstall DC Switch Module.
4.1.11	Measure Pin 3 of Power Supply socket. If meter measures 0 OHMS, replace DC Switch Module with a good DC Switch from Spare Parts Kit.
4.1.12	Measure pin 5, J-1 of sub-chassis cable.
4.1.13	If meter measure 0 OHMS, replace 12 V Regulator.
4.1.14	Measure pin 7, J-1 of sub-chassis cable.
4.1.15	If meter measure 0 OHMS, replace 5 V Regulator.
4.1.16	Install fuses in waterproof enclosure as required.
<u>WARNING:</u>	Caution should be used when power is applied.
4.1.17	Apply AC power, watch for smoke or sparks, smell enclosure for burning wire insulation.
4.1.18	DISCONNECT POWER, check to see if fuses are blown.
4.1.19	If fuses did not blow, replace Power Supply module with a good Power Supply from Spare Parts Kit.
4.1.20	If fuse(s) did blow, remove fuses, check pin 1 of P1 to pin6 of P1 for a short. Also check pin 2 of P1 and pin 6 of P1 for a short.
4.1.21	If there is a short, return waterproof enclosure to Food Instrument Corporation.
4.1.22	If there are no shorts, replace transformer.

4.2	DC POWER SUPPLY TROUBLESHOOTING (<u>No</u> L.E.D.s or digits on front panel light, fuses are good.)	
	<u>CAUTION:</u>	<u>DO NOT</u> APPLY AC POWER AT THIS TIME.
	4.2.1	Remove 10 front panel screws using 7/64" Allen wrench in Spare Parts Kit.
	4.2.2	Separate amplifier assembly (front panel and attached circuit boards) from waterproof enclosure.
	4.2.3	Unplug two cable connections from back of circuit board and set amplifier assembly aside.



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ADR-50D TROUBLESHOOTING GUIDE

	<u>NOTE:</u>	Make all measurements (Steps 4.2.4-4.2.11) and tabulate results. Then compare to conditions in Table 4-A.
	<u>WARNING:</u>	Caution should be used when power is applied due to shock hazard.
	<u>NOTE:</u>	(-) Negative meter lead should be grounded to Waterproof Enclosure.
4.2.4		Apply power and measure violet wire of sub-chassis cable for a (+) positive 5 VDC supply.
4.2.5		Measure the red wire of sub-chassis cable for a (+) positive 12 VDC supply.
4.2.6		Disconnect AC power.
4.2.7		Remove the 12 V regulator module.
	<u>WARNING:</u>	Caution should be used when power is applied due to shock hazard.
	<u>NOTE:</u>	(-) Negative Meter Lead should be grounded to Waterproof Enclosure.
4.2.8		Reconnect AC power and measure pin 2 of the 12 V reg. Module socket for (+) Positive 18 VDC.
	<u>WARNING:</u>	Caution should be used when measuring AC voltages due to shock hazard.
	<u>NOTE:</u>	Change meter to measure <u>AC</u> voltage.
4.2.9		Put meter leads on terminal 7 (purple wire), and terminal 11 (brown wire) of the transformer. Measure for 16 <u>VAC</u> .
4.2.10		DISCONNECT AC power from the white connector of AC power cable.
	<u>NOTE:</u>	Change meter to measure resistance.
4.2.11		Using VOM, measure black and white wires of AC power cable for approximately 60 OHMS.
4.2.12		Check Table 4-A.

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TABLE 4-A

MEASUREMENTS TAKEN	TABULATED RESULTS AND CONDITIONS FOUND					
5 VDC	0	0	0	0	0	5 VDC
12 VDC	0	0	0	0	12 VDC	12 VDC
18 VDC	0	0	0	18 VDC	18 VDC	18 VDC
16 VAC	0	0	16 VAC	16 VAC	16 VAC	16 VAC
60 OHM	infinite	60 OHM	60 OHM	60 OHM	60 OHM	60 OHM
Replace or Check	Trans- former and/or Input to Trans- former	Trans- former and/or Wiring to P.S.	P.S. Module	12 V Reg.	5 V Reg.	Amplifier Assembly

ADR-50D TROUBLESHOOTING GUIDE

4.3

AMPLIFIER ASSEMBLY TROUBLESHOOTING		
	<u>TROUBLE</u>	<u>POSSIBLE SOLUTIONS</u>
4.3.1	Green Position Sense L.E.D. does not light.	<u>Recheck</u> <ul style="list-style-type: none">• Section 4.4, Pan Assembly Repair. <u>Inspect and Repair</u> <ul style="list-style-type: none">• Broken or frayed wires and connections to sense board. <u>Replace (In Order)</u> <ol style="list-style-type: none">1. Sense Board2. Led/Video Board3. Processor Board <u>Check and/or Replace</u> <ul style="list-style-type: none">• Section 4.4, Pan Assembly repair.
4.3.2	Upper Limit or Lower Limit will not adjust correctly.	<u>Check and/or Replace</u> <ul style="list-style-type: none">• Solder connection on switches. <u>Replace</u> <ul style="list-style-type: none">• Processor Board• Front Panel Assembly
4.3.3	ADR readout (3-4) does not read "00" <u>with no</u> container under ADR <u>and</u> position sense triggered.	<u>Replace (In Order)</u> <ol style="list-style-type: none">1. Sense Board2. Processor Board3. Led/Video Board <u>Recheck</u> <ul style="list-style-type: none">• Section 4.4, Pan Assembly Repair.
4.3.4	Reject L.E.D does not light for a reject	<u>Replace (In Order)</u> <ol style="list-style-type: none">1. Sense Board2. Processor Board3. Led/Video Board4. Pan Assembly5. Wire Harness Connections

ADR-50D TROUBLESHOOTING GUIDE

	<u>TROUBLE</u>	<u>POSSIBLE SOLUTIONS</u>
4.3.5	Reject L.E.D. stays lit.	<u>Check</u> <ul style="list-style-type: none"> • Section 3, Operation, Light & Photocell Adjustment. • Vertical Misalignment of light & photocell. • Insert holders. <u>Inspect for Broken or Frayed Wires</u> <ul style="list-style-type: none"> • Docking Module Connector. • Sense Cable (CR-601). • Amplifier Assembly wire harness. • Waterproof Enclosure to Sense Board cable. • Connections between Sense & Processor Board. <u>Replace (In Order)</u> <ol style="list-style-type: none"> 1. Processor Board 2. Sense Board 3. Led/Video Board
4.3.6	Reject Cylinder does not operate.	<u>Check</u> <ul style="list-style-type: none"> • Air supply • Reject/Disable Switch to Rejector. <u>Inspect and Repair</u> <ul style="list-style-type: none"> • Power Cable from Subchassis to Sense Board. • Amplifier assembly wire harness and connectors for broken or frayed wires.
4.3.7	Rejector misses container	<u>Check</u> <ul style="list-style-type: none"> • Cont. Dia. Menu 2/02 • Rej. Dist. Menu 1/03 <u>Replace</u> <ul style="list-style-type: none"> • Processor Board

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4.4	PAN ASSEMBLY TROUBLESHOOTING	
	<u>TROUBLE</u>	<u>POSSIBLE SOLUTIONS</u>
4.4.1	ADR <u>does not</u> read "00" when no can is present under probe.	<u>Replace</u> <ul style="list-style-type: none"> • Mini Probe
4.4.2	No green Position Sense light on Front Panel.	
	4.4.2.1	<u>Clean Position Sense Insert</u>
		<u>Lenses with Dry Cloth</u>
	4.4.2.2	<u>Check Red Light Source Insert</u>
		2.1 Set OHM meter to Diode test.
		2.2 Place meter leads on Pin 3 violet and Pin 4 Black of pan connector, and record resistance reading.
		2.3 Reverse connections and record resistance reading.
		2.4 Remove one lead and connect to pan assembly, and record reading.
		2.5 Compare results with Table 4-B.

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	<u>TROUBLE</u>	<u>POSSIBLE SOLUTIONS</u>
	4.4.2.3	<u>Check Yellow PhotoSensor Insert</u> 3.1 Set OHM meter to Diode test. 3.2 Place meter leads on Pin 2 Blue wire, and Pin 1 Yellow wire of pan connector. 3.3 Using sunlight, flashlight or low wattage incandescent bulb shine light directly on yellow insert lens and record resistance reading. 3.4 Reverse connections and repeat Step 3.3. 3.5 Remove one meter lead and connect to pan assembly, and repeat Step 3.3. 3.6 Compare results with Table 4-B. 3.7 Check Pin Terminals for loose wire in pan assembly. 3.8 Check and/or replace pan cable (C-1A).

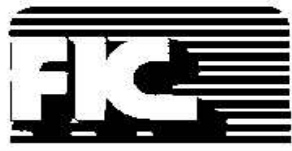
ADR-50D TROUBLESHOOTING GUIDE

TABLE 4-B

INSERT TESTED	METER LEAD CONNECTIONS		
	LEAD TO PAN	FORWARD RESISTANCE	REVERSE RESISTANCE
RED LIGHT SOURCE INSERT	INFINITE	<3K OHMS	>20K OHMS
YELLOW PHOTO-SENSOR INSERT	INFINITE	<div>LIGHT DARK</div> <div><3K OHMS >5K OHMS</div>	<div>LIGHT OR DARK</div> <div>>20K OHMS</div>

If measurements are different than above table, replace inserts as required.

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FOOD INSTRUMENT CORPORATION

The Abridged Guide to ADR-50D Operation ROM # 04256P2

I. Complete instrument installation and mechanical setup as covered in section 2 and 3.0

II. GENERAL OPERATION:

- A. The ADR-50D contains nine main menus. Each, contains various numbers of individual sub-menu or screens items. The lower left hand corner of the display identifies each screen. The main menu number is followed by a diagonal (/) and the specific item number currently being displayed.
- B. Pressing **MENU** scrolls between main menus, displaying in each main menu the first menu item. Pressing **SELECT** scrolls between the various items in each main menu.
- C. The up (↑), down (↓) arrows and **NEXT** keys are used to adjust screen values. A blinking, shaded area creates a **cursor**, which indicates the value under adjustment. The **ENTER** key must be pressed to **set** or **load** an adjusted value into the instrument.

Pressing **NEXT** moves the cursor between columns in any number. For example, pressing **NEXT** when the 2 in 250, moves the cursor to the 5.

In most screens the instrument indicates the adjustment item by an underline which changes to a blinking cursor during adjustment, and then returns to a solid underline once adjustment has been achieved.

III. MAIN MENUS:

#	1st SCREEN TEXT	MENU FUNCTIONS
1	"ADJ.CONTRAST"	Basic Setup
2	"LOAD CONTNR#"	Container Specific Information
3	"SHOW CNT =Y?"	Counters
4	"SEND RAV=Y? "	External Communications
5	"J IN A ROW "	Programmable Counter/Controller
6	"PASSWORD ???"	Password engage access
7	"SET Passwrd1"	Password Modification and Security
8	"SET YEAR "	Clock & Calendar Settings
9	"STATIC Test "	Self testing, stationary containers

NOTE: Main menus are identified by the **first** sub-menu screen text and number.

Main menu titles are **not** displayed, the lower left hand corner of each screen indicates menu and item number.

IV. MAIN and SUB-MENUS

1: BASIC SETUP FUNCTIONS

Screen Text	Translation	Operation Sequence
1/01 "ADJ.CONTRAST"	Adjusts screen contrast	Press ↑ or ↓ arrows
1/02 "SSR-1000 =Y?"	Select Rejector Type ¹	Press ↑ to switch between YES & NO, ENTER
1/03 "ADJ.REJ.DST."	Adjust Rejector Distance ²	Press ↑, ↓, NEXT as needed, press ENTER
1/04 "MINIPROBE=Y?"	Sensor Type: Standard or Mini? ³	Press ↑ to switch between YES & NO, ENTER
1/05 "SERIAL #"	Displays Unit Serial Number	Not Applicable

2: CONTAINER SPECIFIC INFORMATION

Screen Text	Translation	Operation Sequence
2/01 "LOAD CONTNR#"	Loads memory stored data ⁴	↑,↓,NEXT as needed, press ENTER
2/02 "CONTNR.SIZE "	Adjust to closure diameter ⁵	↑,↓,NEXT as needed, press ENTER
2/03" ADJ.SENSTVTY"	Select sensor power level ⁶	Press ↑ or ↓ arrows, press ENTER
2/04" AUTOCAL =CLR"	Autocalibrates	Press CLEAR, run a container at line speed
2/05 "ADJ.CALIBRTN"	Adjusts mid-level value	↑,↓,NEXT as needed, ENTER
2/06 "ADJ.UPR.LIM."	Adjusts upper limit	↑,↓,NEXT as needed, ENTER
2/07 "ADJ.LOW.LIM."	Adjusts lower limit	↑,↓,NEXT as needed, ENTER
2/08 "EZ OPEN =Y?"	Is the closure an EZO?	↑ to switch between YES & NO, ENTER
2/09 "RA UPR.LIMIT"	Adjusts RA upper limit	↑,↓,NEXT as needed, ENTER
2/10 "RA LWR.LIMIT"	Adjusts RA lower limit	Same as above
2/11 "SHOW RA=YES?"	Show rolling average?	↑ to switch between YES & NO, ENTER
2/12 "SAVE CONTNR#"	Save Container Number	↑,↓,NEXT as needed, ENTER

3: COUNTERS

Screen Text	Translation	Operation Sequence
3/01 "SHOW CNT =Y?"	Display Container Counts?	↑ to switch between YES & NO, ENTER
3/02 "SHOW NET =Y?"	Show Net count? ⁷	Same as above
3/03 "CLR ALL CNTS"	Clear all counters?	ENTER
3/04 "CLR TOT CNT "	Clears count of Total Containers	ENTER
3/05 "CLR NET CNT "	Clears Net count	ENTER
3/06 "CLR REJ CNT "	Clear Rejects count	ENTER

4: COMMUNICATIONS

Screen Text	Translation	Operation Sequence
4/01 "SEND RAV=Y? "	Send Rolling Average?	↑ to switch between YES & NO, ENTER
4/02 "RS232 On=Y? "	Turn on RS232 port?	↑ to switch between YES & NO, ENTER

5: PROGRAMMABLE COUNTER/CONTROLLER(OPTION)

Screen Text	Translation	Operation KEYS
5/01 "J IN A ROW"	Program Group:Consec.Rejects ⁸	NA
5/02 "OFF,1=.5,2=1"	J in a ROW Alarm Ena/Disable ⁹	↑ for 0,1,or 2, ENTER
5/03 "OUTPUT CHAN."	J in a ROW Alarm Selector ¹⁰	↑ for 0,1,2,or 3 & E
5/04 "VALUE OF J? "	Adjust J, from 2-32	↑,↓,NEXT, & ENTER
5/05 "TRAP X IN Y "	Program Group: Rejects/Quantity	NA
5/06 "OFF,1=.5,2=1"	X in Y, Alarm Enable/Disable	↑ for 0,1,or 2, ENTER
5/07 "OUTPUT CHAN."	X in Y Alarm Selector	↑ for 0,1,2,or 3 & E
5/08 "VALUE OF X? "	Adjust X, from 1 - 99	↑,↓,NEXT, & ENTER
5/09 "VALUE OF Y? "	Adjust Y, from 10 - 9000	↑,↓,NEXT, & ENTER
5/10 "TRAP S IN T "	Program Group: Rejects/Time	NA
5/11 "OFF,1=.5,2=1"	S in T minutes Alarm Enable/Disable	↑ for 0,1,or 2, ENTER
5/12 "OUTPUT CHAN."	S in T minutes Alarm Selector	↑ for 0,1,2,or 3 & E
5/13 "VALUE OF S? "	Adjust S, from 2 - 30	↑,↓,NEXT, & ENTER
5/14 "VALUE OF T? "	Adjust T, from 1 - 30	↑,↓,NEXT, & ENTER
5/15 "TRAP 1ofP/Q "	Program Group: Repeat Patterns	NA
5/16 "OFF,1=.5,2=1"	1 of P/Q Alarm Ena/Disable	↑ for 0,1,or 2, ENTER
5/17 "OUTPUT CHAN."	1 of P/Q Alarm Selector	↑ for 0,1,2,or 3 & E
5/18 "VALUE OF P? "	Adjust P from 2 - 99	↑,↓,NEXT, & ENTER
5/19 "VALUE OF Q? "	Adjust Q from 2 - 30	↑,↓,NEXT, & ENTER
5/20 "> RAU LIMIT "	Program Group: RA Upper Limit ¹¹	NA
5/21 "OFF,1=.5,2=1"	RA Upr Lim Alarm Ena/Disable	↑ for 0,1,or 2, E
5/22 "OUTPUT CHAN."	RA Upr Lim Alarm Selector	↑ for 0,1,2,or 3 & E

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Main & Sub-Menus, Continued

5/23	"< RAL LIMIT "	Program Group: RA Lower Limit ¹¹	NA
5/24	"OFF,1=.5,2=1"	RA Lwr Lim Alarm Ena/Disable	↑ for 0,1,or 2, E
5/25	"OUTPUT CHAN."	RA Lwr Lim Alarm Selector	↑ for 0,1,2,or 3 & E

6: **PASSWORD OVERRIDE ACCESS**

6/01	"PASSWORD ???"	Enter Password (to allow change) ¹²	↑,↓,NEXT, & ENTER (CLEAR ¹³)
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7: **PASSWORD MODIFICATIONS AND SECURITY**

Screen Text	Translation	Operative Keys
7/01 "SET Passwr1"	Set Password #1 ¹⁴	↑,↓,NEXT, & ENTER
7/02 "SET PASSWRD2"	Set Password #2	↑,↓,NEXT, & ENTER
7/03 "SET PASSWRD3"	Set Password #3	↑,↓,NEXT, & ENTER
7/04 "PW TIME(MIN)"	Password Timeout Duration ¹⁵	↑,↓,NEXT, & ENTER
7/05 "PW ENABLE=Y?"	Enable/Disable Security	↑ for YES or NO, ENTER

8: **NOT USED**

9: **SELF TESTING, STATIONARY CONTAINERS**

Screen Text	Translate	Operative Key
9/01 "STATIC Test "	STATIC TEST (next key)	Press NEXT
9/02 "ROM# 05082P1"	Display ROM version #	NA
9/03 "PROBE TST = Y?"	Test Probes	↑ for YES or NO, ENTER
9/04 "RAM CLR TST"	Used in factory setup	N/A
9/05 "PULSESON = Y?"	Used in factory setup	N/A

V. **SETTING UP YOUR FIRST CONTAINER:**

- A. Complete installation as described in the Manual, Section 2 and Mechanical Set Up in Section 3.0, taking note of the accurate distance between the rejector (at bumper C/L) and sense probe C/L (or position sensor centerline). Power up instrument.
- B. Adjust screen contrast to suit, go to 1/01, adjust with the ↑ ↓ arrows.
- C. Enter rejector distance in millimeters (from 1/01, press **SELECT** twice to arrive at 1/03, enter distance with ↑,↓ and/or **NEXT** keys, press **ENTER**)
- D. Press **MENU** once to go to the second menu, first item, "Load Container". Press **SELECT** to go to 2/02 "Contrn. Dia." (Load Container does not apply until containers have been **saved** in item 2/11) Enter container diameter in millimeters (using ↑ ↓ and/or **NEXT** keys) when correct, press **ENTER**.
- E. Press **SELECT** to go to item 2/03, "Autocalibrate". Press **CLEAR** and run a container under the instrument at standard conveyor line speed.
- F. The far right side of the display will then show a 75 upper limit, a middle value of 50, and a lower limit of 25.
- G. To modify upper limit, press **SELECT** twice to go to item 2/06. Adjust the upper limit values to suit individual requirements with the ↑ ↓ and/or **NEXT** keys, press **ENTER**.
- H. To modify the lower limit, press **SELECT** once to bring up item 2/07, and adjust values appropriately with ↑ ↓ and/or **NEXT**, press **ENTER**.

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Main & Sub-Menus, Continued

- I. If using an EZ open end, press **SELECT** once to bring up screen 2/08, press the up arrow (↑) changing the display to YES, and press **ENTER**.
- J. Rolling average can be adjusted in menus 2/09 and 2/10. However it's recommended these be set after observing the RA values automatically established by the ADR. Excursions will be noted on the display, indicating values which when loaded, will prompt the yellow and red flashing RA LED as excursions occur.
- K. Press **SELECT** until 2/12 "Save Contr#" is displayed. Load a number by pressing the arrow (↑) keys and **NEXT** until the preferred number is displayed at the cursor. Press **ENTER**.

Setup and operation is now complete. Follow the same procedure for successive containers. At changeover to a previously loaded container, simply go to Main Menu 2/01, "Load Contr#", enter the (**Page 4, Operating the ADR 50D**) container number established in K using the arrow keys (↑↓), **NEXT**, then press **ENTER**. All data stored specific to that container number is recalled and immediately applied.

Footnotes:

- 1) 1/02 The SSR 1000 is the standard rejector supplied with the ADR 50D instruments. Set to NO only if system configuration includes the optional HSR 2000 High speed Rejector.
- 2) 1/03 Rejector Distance is the distance from the rejector centerline to ADR position sensors' centerline in millimeters.
- 3) 1/04 50D and DR instruments are standard equipped with either probe, DRB instruments with the Miniprobe. Setting is correctly set at the factory. If reset incorrectly, the instrument will be *incapacitated*.
- 4) 2/01 Loading a new container automatically **RESETS** all counters.
- 5) 2/02 Closure Diameter in millimeters is required.
- 6) 2/03 There are five levels of sensitivity 0 to 4. 0 being the lowest, 1 being the standard setting. Generally only being changed with extreme changes in closure diameter or configuration.
- 7) 3/02 Initial display shows total containers processed and rejected, NET count is displayed at YES, gross count at NO.
- 8) 5/01 In the Programmable/Counter Controller menus, one screen is used to announce, or identify the individual program and it's associated screens. These screens, here referred to as PROGRAM GROUP: (as appropriate) have no user selectable settings.
- 9) 5/02 These screens engage or disengage the alarm system, and define the *type* of signal: 0 turns OFF the alarm, 1 provides a non-latched, single signal, 2 provides a latched signal requiring operator action to disengage when used with the AIC 110, or 50 and 100 milliseconds signals respectively when used without the AIC 110.
- 10) 5/03 Selects between four possible output channels (0,1,2,3) for the specific programs' alarm at occurrence.
- 11) 5/20 Rolling Average values (Upper & Lower Limits) are set in screens 2/09 and 2/10.
- 12) 6/01 Not seen unless Password Security is **ON**.
- 13) 6/01 In this screen, pressing **CLEAR** terminates the "PASSWORD TIME OUT" period.
- 14) 7/01 Visible only when security is **OFF**. When security is **ON**, the entry of password 1 (in menu 6/01) is required to view and access menu 7.
- 15) 7/04 Determines the length of operator instrument access once password privileges are invoked.

ADR-50D

COMMUNICATIONS DATA PACKET INFORMATION

The RS-232 communications (Level 1) consists of data packets that represent either lid deflection or rolling average information. The data packets are composed of a registration byte, a type byte and finally two or more data bytes. This structure is represented in the figure below for the four types of data packets that are supported in this release.

	Reg. Byte	Type Byte	Data Byte			
Good Container Lid Deflection	()	(!)	(5)	(0)		
Container Lid Deflection	()	(")	(1)	(5)		
In-Bounds Rolling Average	()	(#)	(4)	(9)	(.)	(1)
Out-Bounds Rolling Average	()	(\$)	(2)	(8)	(.)	(9)

The Registration Byte is an Ascii 'space' (hexadecimal '20'). Whenever this byte is seen in the data stream it signifies that a new data packet is beginning. This may occur even if all the data from the preceding packet has not been received. Therefore, the receiving software must keep a constant check for this possibility and discard any incomplete data packet information.

The Type Byte is the descriptor of the kind of information in the packet and indirectly the length of the packet. Lid deflection information packet descriptors can be either a (1) exclamation point or a (") quote denoting either a good or bad lid deflection respectively. Good and Bad determination is a 50D based decision predicated on the upper and lower lid limit settings.

Rolling average information packet descriptors can be either a (#) pounds sign or a (\$) dollar sign denoting either an in-bounds or out-of-bounds rolling average respectively. In-bounds and Out-of bounds determination is a 50D based decision predicated on the RAV upper and lower boundary settings.

The Data Byte portion of the data packet varies in length based on the type of information being sent by the ADR-50D. For Lid Deflection type packets, the data portion of the packet is 2 bytes (4 bytes for the entire packet). For Rolling Average type packets, the data portion of the packet is 4 bytes (6 bytes for the entire packet).

The RS-232 Transmission characteristic for setting up the users receiver are:

[9600 Baud, 8 data bits, 1 stop bit, odd parity.]

Hardware handshaking is employed using the modem control signals RTS, CTS, DCD and DSR.