Cardinal®
DETECTO

AS 400D Series
Intelligent Scale Base
Setup and Operation Manual

REGISTERED ISO 9001

INTRODUCTION

Thank you for your purchase of our Detecto AS-400D Series Intelligent Scale Base. It was built with Detecto quality and reliability at our factory in Webb City, Missouri. The AS-400D series scales consist of the AS-400D, AS-410D and AS-420D. All scales are equipped with a bi-directional RS232C compatible port for communication with a computer.

FCC COMPLIANCE STATEMENT

Notice: This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference in which case the user will be responsible to take whatever measures necessary to correct the interference.

TRADEMARKS

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Serial Number _____

Date of Purchase_____

Purchased From _____

_____

_____
RETAIN THIS INFORMATION FOR FUTURE USE

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SPECIFICATIONS

Scale Capacity:	
400D = 100 lb	0 to 100 lb x 0.5 oz
410D = 150 lb	0 to 100 lb x 0.5 oz & 100 to 150 lb x 1 oz
420D = 200 lb	0-200 lb x 0.1 lb
Platform Size:	
400D 410D	18 in x 18 in (46 cm x 46 cm)
420D	24" x 24" (61 cm x 61 cm)
Display:	6 digit, 7 segment, red LED, 1/2" high
Annunciators	lb, lb-oz, ZERO
External Controls	ZERO Button
Power	110 to 120 VAC (50/60 Hz)

The AS 400D Series scale is shipped from the factory in the following configuration:

9600 Baud	8 Data Bits
No Parity	1 Stop Bit

**Pounds/Ounces Mode
(NOTE! AS-420D is Pounds only)**

PRECAUTIONS

Before using this instrument, read this manual and pay special attention to all "WARNING" symbols:

⚠ IMPORTANT   ⚡ ELECTRICAL WARNING

INSTALLATION

On receipt of your AS-400D series scale, carefully unpack the scale removing all packing material. Examine the scale to make certain there is no shipping damage. Should damage be discovered contact the shipping company as soon as possible. The packing material and shipping carton should be retained for possible examination by the shipping company.

Determine where the scale is to be located. It should be a smooth surface capable of supporting both the scale and any load apt to be placed on the scale. It should not be in direct sunlight nor should it be subject to air flow from heating/cooling vents, fans or similar devices.

Place the scale in the chosen location and remove the stainless steel platform. The platform can be removed by lifting upward on it removing it from the weighbridge. Locate the small level indicator on the weighbridge and check to make certain that the scale is level. If the level indicator does not show a level indication, the mounting feet should be adjusted to obtain a level condition. To adjust a mounting foot, first loosen the lock nut then turn the mounting foot in the required direction to raise or lower that corner of the scale. Once a level condition has been achieved, secure the mounting foot settings by tightening each of the lock nuts. Replace the platform on the weighbridge.

Plug the power cord into a 115/120 VAC grounded polarized power outlet, making certain that the power cord is not in the way of normal traffic.

If you are unsure whether your power outlet is correct, you should consult a qualified electrician.

Plug the power cord into the power receptacle on the rear of the scale base. If the display illuminates with a display segment test, installation of the scale is complete. If not, check to make sure that the power outlet and the scale fuse are good.

Locking Nut

Mounting Foot
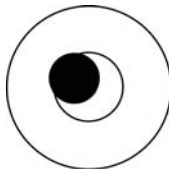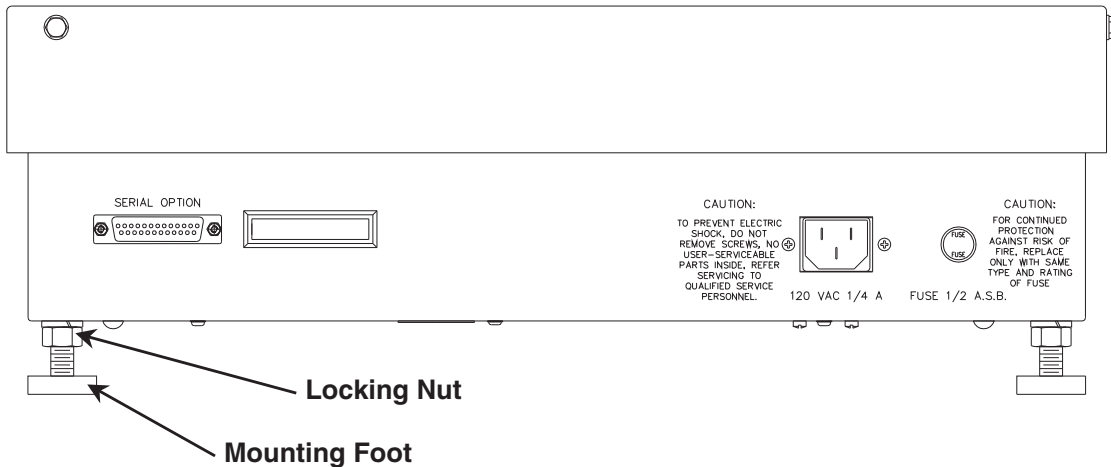
NOT LEVEL
Bubble is not within circle
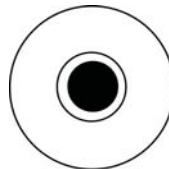
LEVEL
Bubble is within circle

BAUD RATE AND WEIGHT MODE SELECTION

The AS-400D and AS-410D can be operated in either a pounds/ounces mode or UPS pounds only mode. A setup switch makes this selection. The AS-420D operates only in a pounds mode and cannot be set to a pounds/ounces mode of operation.

⚠️ **NOTE! Although the AS-420D operates in a pounds only mode, it does not use the UPS pounds only command set.**

Switch S1 (2, 3 and 4) are used to select the baud rate for serial communication via the scale port. Switch S1 (1 and 5) are used to select the weight mode.

To gain access to the switch S1:

1. Unplug the scale from the power outlet.
2. Remove the stainless steel platform.
3. Once the platform has been removed, you will see the switch located on the main printed circuit board.
4. Using a small screwdriver or similar device, set the five switches to the desired setting as indicated in the table.
5. Replace the scale platform, and then plug in the power cord. This will reset and restart the scale for normal operation.

| FUNCTION	SETTING	S1-1	S1-2	S1-3	S1-4	S1-5
Baud Rate	19200		OFF	OFF	OFF	
	9600		ON	OFF	OFF	
	4800		OFF	ON	OFF	
	2400		ON	ON	OFF	
	1200		OFF	OFF	ON	
	600		ON	OFF	ON	
	300		OFF	ON	ON	
	DISABLED		ON	ON	ON	
Weight Mode	Pounds/Ounces	OFF				OFF
	UPS Pounds Mode	ON				ON

⚠️ **NOTE ! Change switch settings only with power to the scale disconnected! If changing between Pounds/Ounces and Pounds only mode, the scale <u>must</u> be recalibrated.**

Settings For UPS Online Users

The AS-400D and AS-410D dip switches must be set as follows to work with UPS OnLine software. Set scale type to Fairbanks 70-2453-4 in the UPS software.

Switch	1	2	3	4	5
Setting	ON	ON	OFF	OFF	ON

- 9600 Baud
- 7 Data Bits
- Odd Parity
- 1 Stop Bit
- UPS Pounds Mode

⚠️ **NOTE! Change switch settings only with power to scale disconnected!**
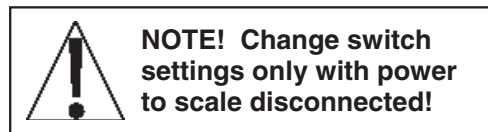
SERIAL INTERFACE PROTOCOL

When communicating in host mode using the Detecto AS-400D and AS-410D pounds/ounces mode or AS-420D pounds only mode (not the UPS Pounds Mode), the serial data is transmitted and received using 8 data bits, no parity and one stop bit. The host computer sends request to the scale in the form of ASCII or HEX characters. The following is a list of commands that can be sent by the computer and the scale response:

COMMAND	SCALE RESPONSE
^N (control N, hex 0E)	Scale sends weight data continuously
^O (control O, hex 0F)	Stop continuous weight data
~ (tilde, hex 7E)	Weight data sent once in pounds/ounces mode
^X (control X, hex 18)	Zero the scale from the PC
ESCAPE (ESC, hex 1B)	Reset the scale from the PC

SCALE WEIGHT DATA STRINGS

AS-400D, AS-410D Pounds/Ounces Mode

Output Data Format: SspppbLBbww.wbOZbxccE

where:

S	=	ASCII STX (HEX 02)
s	=	weight sign (space or -)
ppp	=	weight lb, leading zero suppressed
b	=	space
LB	=	the text "LB"
ww.w	=	weigh ounces, leading zero suppressed
OZ	=	the text "OZ"
x	=	status: M = motion on scale
		C = scale over capacity
cc	=	checksum - these two characters are the ASCII representation of the computed checksum (HEX 3x, HEX 3x where xx is the exclusive-or of all data from the STX to the status character)
E	=	ASCII ETX (HEX 03)

AS-420D Pounds ONLY Mode

Output Data Format: swwwww.wxccE   (12 bytes total)

where:

s	=	weight sign (space or "-")
wwwww.w	=	weight (lb and 1/10 lb including decimal point)
x	=	status: M = motion on scale
		C = scale is over capacity
cc	=	checksum (ASCII representation of computed checksum)
E	=	ASCII ETX (03H)

CALIBRATION

The AS-400D series scale was calibrated at the factory during final inspection and should not require adjustment. In the event the scale should need re-calibration, the following calibration procedure should be performed. To maintain the scale's high degree of accuracy, it is recommended that a qualified technician with certified test weights re-calibrate the scale.

Before beginning calibration, the following equipment is required:

- Calibrated test weights (50 lbs)
- No. 1 Phillips and 3/16 or 1/4 slotted screwdriver

To Calibrate The Scale:

1. Unplug the scale from the power outlet.
2. Remove the stainless steel platform.
3. Once the platform has been removed, locate the calibration jumper J12 on the main circuit board. **NOTE!** On the AS-400D, locate the calibration seal (plastic cover) and remove the cover by removing the two (2) small slotted screws on the bottom of the scale. This will expose the calibration jumper J12.
4. Remove the jumper by pulling upwards.
5. Replace the scale platform onto the scale.
6. Plug in the power cord.
7. After the power-up sequence, the display should appear blank.
8. Press and hold the **ZERO** switch on the front of the scale base until $LOAd$ is displayed.
9. Place a 50-pound weight onto the platform and press the **ZERO** switch.
10. Wait until $UnLOAd$ appears on the display, then remove the weight.
11. Press the **ZERO** switch and wait until the display shows $dOnE$.
12. Unplug the scale from the power outlet, and then remove the scale platform.
13. Replace the jumper onto J12.
14. Replace the scale platform, and then plug in the power cord. This will reset and restart the scale for normal operation.

> **NOTE! If changing from Pounds to Pounds/Ounces mode or from Pounds/Ounces to Pounds mode, the scale <u>must</u> be recalibrated.**

Zeroing The Scale

To force the scale to a zero ($0\ 00$) weight reading at any time, press the **ZERO** switch. If the zero ($0\ 00$) could not be executed, check for one of the following reasons:

- There was motion present on the scale at the time.
- The scale was in an over-capacity condition

CARE AND MAINTENANCE

- DO NOT subject the scale platform to sudden shocks or impact.
- DO NOT expose to direct sunlight or temperature extremes or any rapidly moving air source.
- DO NOT use acetone or other volatile solvents for cleaning the scale.
- DO NOT submerge the scale in water, pour or spray water directly on it.
- DO clean the scale with a soft cloth dampened with a mild detergent.
- DO provide good, safe ground and clean AC power.
- DO keep the area around the scale clear to provide adequate air circulation.

DESIGNED & MANUFACTURED * IN U.S.A. *