1200 Series

Digital Indicator

Technical Manual

MAN350 – Rev 2 Doran Scales, Inc. www.doranscales.com

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Introduction

Thank you for purchasing a Doran Scales product. Please read this manual to ensure obtaining all the benefits that this indicator can provide. If any questions arise, please contact the Doran Scales Technical Support Department at 630-879-1288.

Unpacking Your Scale

Before unpacking your Doran scale, please read the instructions in this section. Your new scale is a durable industrial product, but it is also a sensitive weighing instrument. Normal care should be taken when handling and using this product. Improper handling or abuse can damage the scale and result in costly repairs that will not be covered by the warranty. If you notice any shipping damage, notify the shipper immediately. Please observe the following precautions to insure years of trouble free service from your new scale.

- DO NOT drop the indicator
- DO NOT immerse the indicator
- DO NOT drop objects on the platform
- DO NOT pick up the scale by the top of the weighing platform
- Carefully remove the scale from the shipping carton

Specifications	
NTEP Certificate	Class III – 10,000d; Cert. 19-013
Enclosure	ABS Plastic
Product Dimensions	9” W x 7.5” H x 2.75” D (includes u-bracket)
Environmental Protection	IP5X
Legal for Trade Temperature Range	14 F to 104F (-10 C to +40 C)
Capacity Range	1 to 999,000 lb
Resolution Range	1,000 to 30,000d
Internal Counts	1,000,000
Analog Signal Range	0 mV/V to 10 mV/V
Excitation Voltage	5 VDC
Number of Load Cells	Up to 4 350 Ohm with 4 wire input
Scale Inputs	One
Calibration Range	Calibrate between 10% and 100% of capacity
Power Input	100 – 240VAC 50/60Hz
Internal Rechargeable Battery	35 hours of continuous use with four load cells 7.4 V, 4 AH, 1000 recharge cycles
Display	1.6" high, 6 digit Backlit LCD
Displayed Units	lb, kg
Serial Interface	Bi-directional RS-232 port standard
Controls	Total, Count, Units, Gross, Tare, Zero, Print (On/Off)

Fig. 1: Front Panel

Scale Function

~	Motion indicator. This symbol represents motion or instability of the weight. The annunciator will illuminate when motion is sensed on the platform. Changes in weight, vibration or air currents can cause the scale to go into motion.
→0←	Center of zero indicator. The annunciator will illuminate while the scale is displaying a zero weight.
NET	Indicates a net weight is displayed. Net weight is displayed when a tare value is present.
lb / kg	Indicates current unit of measure
TOTAL	Lit when accumulator function is active. F1.10 parameter controls the current function. Checkweighing is the default function.

Under, Accept and Over in checkweigh mode. F1.10 parameter controls the current function. Checkweighing is the default function.

Indicates the count function is active

Indicates the accumulation function is active

Battery indicator

Power Up

Connect the cord to a compatible power source. Briefly press PRINT (On/Off) until the scale beeps.

Basic Weighing Operation

1) Remove all items from the scale platform
2) Press the ZERO button to zero the scale
3) The weight display now reads zero
4) Place an item on the scale platform and wait for the motion annunciator to turn off, indicating an accurate, stable weight

ZERO

ZERO is used to zero the scale display. To zero the scale, wait until the scale is stable and press the ZERO button. The scale will not zero if the scale is in motion. The zero function will operate over the entire capacity of the scale. ZERO will not function in the net mode.

UNITS

UNITS selects the current unit of measure. Press UNITS to change the current unit. Lb and kg are available.

PRINT

PRINT transmits weight data to a printer or other external devices.

GROSS

When in net weighing mode, press to return to gross mode and clear the tare value.

TARE

Press to tare the current displayed weight. The indicator enters net mode. Note that tare only functions with positive weights. When in net mode, the ZERO function is not functional.

TOTAL (Accumulator)

The TOTAL annunciator is lit when the accumulation function is active. The accumulator will track the number of weights and total amount of weight on the scale. Do not change units during an accumulation process.

Accumulate

1. Place item on the scale
2. Press TOTAL to accumulate current weight
3. Add--- is displayed while saving to memory
4. Remove item from scale
5. Weight must return to zero before the next weight can be added to the accumulated total.

Display Accumulator

1. Press and hold TOTAL until totAL is displayed
2. Cn is displayed showing the current count
3. Press GROSS to display the total accumulated weight
4. Press PRINT to exit to weighing

Clear Accumulator

1. Press and hold TOTAL until totAL is displayed
2. Cn is displayed showing the current count
3. Press GROSS to display the total accumulated weight
4. Press ZERO to clear the accumulator
5. Press PRINT to exit to weighing

COUNT (Piece Counting Function)

Press COUNT to switch between weight and count display. When displaying piece count, a n is displayed in the leftmost digit. Parameter F2.4 controls the method of piece count entry. F2.4 = 0 will use platform weight to calculate piece weight. F2.4 = 1 will use manual piece weight entry.

Set piece weight with platform weight (F2.4 = 0)

1. Place the container on the scale
2. Press ZERO
3. Place the piece sample into the container
4. Press and hold COUNT until SAnPLE is displayed
5. Press PRINT
6. Enter the number of pieces on the scale
7. Press PRINT
8. Piece count is displayed

Set piece weight with manual weight entry (F2.4 = 1)

1. Place the container on the scale
2. Press ZERO
3. Place the piece sample into the container
4. Press and hold COUNT until SAMPLE is displayed
5. Press PRINT
6. Enter the number of pieces on the scale (UNITS and GROSS select digit, TARE and ZERO increment and decrement digit value)
7. Press PRINT
8. Input the total weight of the sample
9. Press PRINT

Checkwieghing Function

For checkweighing set the F2.1 to the lowest weight where the checkweigh annunciators will be active.

Set F2.2 to the Under limit
Set F2.3 to the Over limit

Any weight between the Under and Over limit will activate the OK annunciator

Operation Error Codes

[--□--]	Invalid operation
[-----]	Overload condition: The weight on the platform is greater than scale capacity.
[_____]	Underload condition: The weight is under the calibration zero.
[-no-]	Zero is above the allowed range (F1.8)
[_no_]	Zero is below the allowed range (F1.8)

Battery Operation

The indicator will run continuously for up to 38 hours with four 350 ohm load cells. To maximize battery life, set the Automatic Shutoff Timer (F3.5) which will automatically powers down the scale after a period of non-use.

Power Off

1) Manual - Press and hold the PRINT push button until the display turns off.
2) Automatic - At the end of the Automatic Shutoff Timer (F3.5) scale parameter setting.

Low Battery

The battery annunciator indicates that the battery is in need of recharging. Once it indicates no remaining bars, there will be approximately one hour of battery life remaining before the scale turns off.

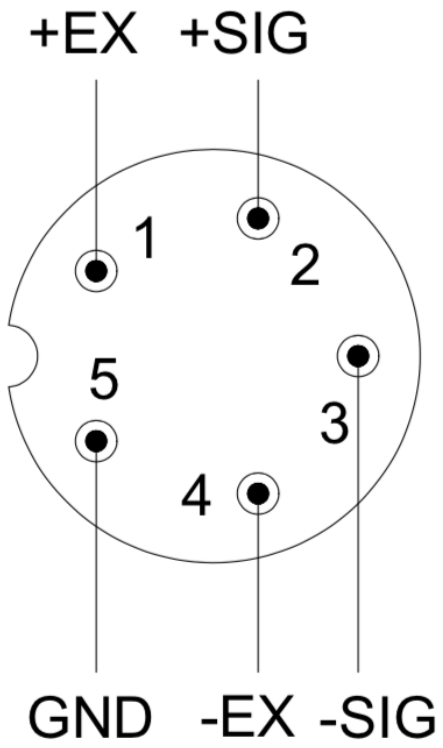
Recharging Battery

To charge the battery, plug the wall mount transformer into a wall outlet. While the scale is charging, light on the wall mount transformer is red. When completed charging, the wall mount transformer light is green. The battery will fully charge in approximately eight hours. The scale can be used while recharging the battery.

Leaving the scale plugged in will ensure a fully charged battery and will not affect the life of the battery. The battery supports up to 1000 recharges before requiring replacement.

Load Cell Connection

Load Cell Connector Pinout



	Description	PIN
+ SIG	+ Signal	2
- SIG	- Signal	3
+ EX	+ Excitation	1
- EX	- Excitation	4
GND	Ground	5

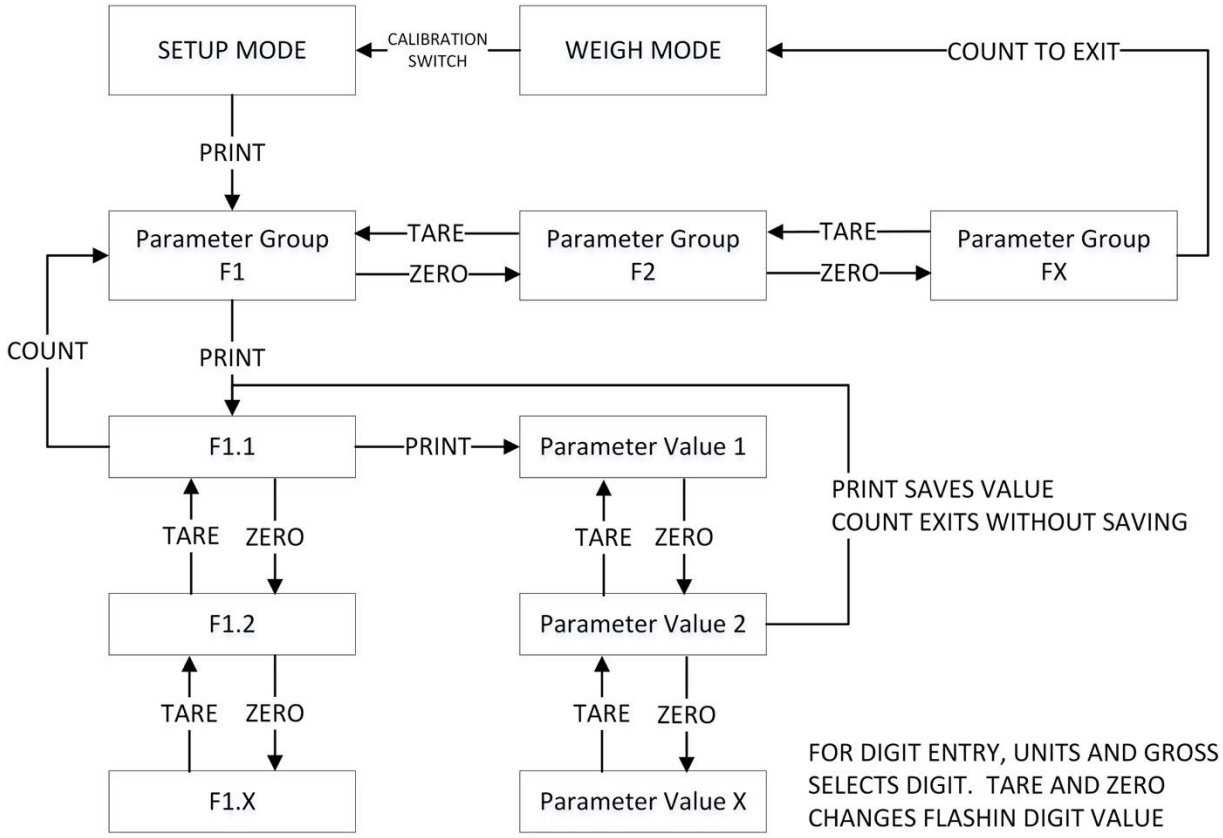
Scale Setup Guide

Entering Setup Mode

The calibration push button is located behind a door on the rear of the indicator. Remove the screw and press and hold the button down until the scale beeps. SEtuP will be displayed. All menus are accessible.

Press and hold GROSS to access menus F2-5. Calibration menu F1 is not accessible.

Setup Mode Navigation



Set Scale Capacity

To set the scale capacity, select kg or lb before entering setup to select the primary unit. Once this is set, a calibration in F1.4 and F1.5 must be performed to set the primary unit and capacity.

1. Display reads Setup
2. Press PRINT
3. F1 is displayed
4. Press PRINT
5. F1.1 is displayed
6. Press PRINT
7. Press ZERO and TARE to change the value of the flashing digit
8. Press UNITS and GROSS to select the current digit
9. Press PRINT once the correct capacity is displayed
10. Press COUNT twice to exit the setup mode if desired

Set Number of Decimal Places

1. Display reads Setup
2. Press PRINT
3. F1 is displayed
4. Press PRINT
5. F1.1 is displayed
6. Press ZERO
7. F1.2 is displayed
8. Press PRINT
9. The number of decimal places is displayed
10. Press ZERO to select the correct value
11. Press PRINT once the correct capacity is displayed
12. Press COUNT twice to exit the setup mode if desired

Set Scale Resolution

1. Display reads Setup
2. Press PRINT
3. F1 is displayed
4. Press PRINT
5. F1.1 is displayed
6. Press ZERO
7. F1.2 is displayed
8. Press ZERO
9. F1.3 is displayed
10. Press PRINT
11. The count by value is displayed
12. Press ZERO to select the correct value
13. Press PRINT once the correct capacity is displayed
14. Press COUNT twice to exit the setup mode if desired

Calibration Error Codes

【Err 05】	The entered span calibration weigh is too light, the calibration input weight should be ≥10% of scale capacity.
【Err 06】	The span calibration weight is too light, the loading weight should be ≥10% of scale capacity
【Err 07】	The scale is in motion and cannot calibrate

Parameter Groups

The scale parameters are divided up into five parameter groups. Each group contains related parameters.

F1	Capacity and Calibration
F2	Piece Count Configuration
F3	Date / Time and Shutoff Timers
F4	Data Output
F5	Indicator Test

F1.0	**Base Capacity and Calibration Unit**
0, 1	0: kg 1: lb

F1.1	**Capacity Adjustment Menu**
1 - 999000	3 lb / kg to 200,000 lb / kg Press GROSS and UNITS to select flashing digit Press TARE and ZERO to change digit value

F1.2	**Resolution Decimal Places**
0-4	Select number of decimal places for scale resolution

F1.3	**Resolution Selection**
1, 2, 5 10, 20, 50	Select number of decimal places for scale resolution 10, 20 and 50 are selectable when F1.2 is set to 0

F1.4	**Zero Calibration**
E-SCL	Empty scale platform. Press PRINT. The display will count down from 10 to 0 and display End when complete.

F1.5	**Span Calibration**
LOAd	Press PRINT to enter the span calibration weight. The span calibration weight must be at least 10% of the total scale capacity. Place weights on scale and press PRINT to calibrate. The display will count down from 10 to 0 and display End when complete. Press GROSS and UNITS to select flashing digit Press TARE and ZERO to change digit value

F1.6	**Automatic Zero**
0.5, 1, 3	Number of divisions the scale will automatically zero to maintain zero. This feature is disabled when in net mode.

F1.7	**Power On Zero**
OFF, 2, 10	Percentage of capacity that can be automatically zeroed when powering on. Off (disabled), 2% of capacity and 10% of capacity are selectable.

F1.8	**Zero Button Range**
OFF, 1.9, 100	Amount of capacity that can be zeroed. Off (disabled), 1.9% and 100% of capacity are selectable. 100% is the default

F1.9	**Digital Filter**
0-9	0 is slowest 9 is fastest setting. 5 is the default setting.

F1.10	**Scale Function**
0, 1,2	0: activates checkweighing function 1: activates accumulation function 2: activates counting function (See F2.4)

F1.11	**Factory Default**
0, 1	Set to 1 and press PRINT to default scale parameters. Scale calibration data is retained.

F2.1	**Minimum weight for checkweigh indicators to activate**
0 to capacity	

F2.2	**Checkweighing Lower Limit**
0 to capacity	

F2.3	**Checkweighing Upper Limit**
0 to capacity	

F2.4	**Sampling Method for Counting Function**
0, 1	0: piece weight sample from platform 1: manual piece weight entry

F3.1	**Date Format**
0, 1, 2	0: year.month.day 1: month.day.year 2: day.month.year

F3.2	**Date Entry**
00.00.00	Enter the date per the format selected in F3.1 Press GROSS and UNITS to select flashing digit Press TARE and ZERO to change digit value

F3.3	**Time Entry**
00.00.00	Enter in 24 hour format, hour:minute:second. Press GROSS and UNITS to select flashing digit Press TARE and ZERO to change digit value

F3.4	**Backlight Auto Shutoff Timer**
0-999	Defaults to 0 which disables this feature When set to 1-999 sec the display enters sleep mode Press GROSS and UNITS to select flashing digit Press TARE and ZERO to change digit value

F3.5	**Automatic Shutoff Timer**
0-60	Defaults to 0 which disables this feature When set to 1-60 min the indicator shuts off Press GROSS and UNITS to select flashing digit Press TARE and ZERO to change digit value

F4.1	**Data Output Format**
0, 1, 2	0: No data is transmitted 1: When the scale is stable as indicated by the motion annunciator, a data string is transmitted 2: Data output when PRINT is pressed (see F4.4) See Data Communications section for formats

F4.2	**Data Bits and Parity Settings**
	8 n 1 8 databits, no parity and 1 stop bit 7 E 1 7 databits, even parity and 1 stop bit 7 O 1 7 databits, odd parity and 1 stop bit 8 E 1 8 databits, even parity and 1 stop bit 8 O 1 8 databits, odd parity and 1 stop bit

F4.3	**Baud Rate**
2400 4800 9600 19200	

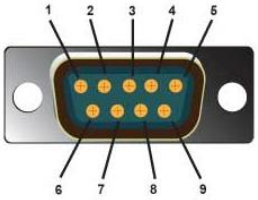
F4.4	**Additional Line Feed (F4.1 set to 2)**
0-9	Additional line feeds at the end of the data output

F5.1	**Button Test**
PrESS	Press each button to verify functionality. Press TOTAL to exit.

F5.2	**Display Test**
	Press PRINT to exit

F5.3	**Raw Counts**
	Displays A/D raw output

Data Communications

DB9 Male Bulkhead Connector	Pin	Function
	2	TXD
	3	RXD
	5	GND

Print Formats

F4.1 set to 1 – Continuous Output. Only weight is transmitted in this mode.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
S	S	,	G	G	,	SP	W	W	W	W	W	W	W	U	U	CR	LF
S	T	,	G	S	,				5	0	0	.	0	l	b		

SS
- OL (overload or underload)
- ST (stable)
- US (unstable)

GG
- GS (gross weight)
- NT (net weight)

SP – Space
WWWWWWW – 6 weight digits with decimal point. Spaces before weight if not 6 digits.
UU – Current unit lb or kg
CR – Carriage Return
LF – Line Feed

F4.1 set to 1 – Print on demand. Press PRINT to send weight data. The scale must return to zero before printing again. Parameter F4.4 adds line feeds to the end of the data string for ease of use with tape printers.

Weight

```
          LIST
Date      MMDDYY
Time      HH:MM:SS
--------------------------------
Gross     XXXXXXX lb
Tare      XXXXXXX lb
Net       XXXXXXX lb
```

Count

```
          LIST
Date      MMDDYY
Time      HH:MM:SS
--------------------------------
Count     XXXXXX PCS
```

Troubleshooting

If any problem persists, contact Doran Tech Support at 630-879-1288.

Problem	What to Do or Check
Weight reading will not repeat or does not return to zero when weight is removed	Examine the weighing platform for any interferences. Be sure that nothing is inside the platform, under the load cell or the weigh bridge structure
Scale overloads before reaching full capacity	Make sure all four corner overload stops are properly set, if present. Take the platter off the scale, invert it and place it on the platform. With 1/2 of the scale's capacity in test weights concentrated over a corner of the platform, there should be approximately 1/32" of clearance between the stop and the bottom of the spider. Check all four corners then recalibrate the scale.
Scale will not indicate full capacity or go into overload	Make sure that there is nothing caught in the scale under or around the load cell or spider, which would interfere with their movement. If not, check the overload stops using the above procedure.
Scale will not zero when the ZERO button is pressed	Make sure that the scale is stable (annunciator is off) when ZERO is pressed.
Weight readings don't seem to be correct	Check the scale's accuracy with a test weight. Recalibrate if necessary.
Scale drifts off of zero	Check for air currents and/or vibration around the scale. If that is the cause, it may be necessary to set the F1.6 parameter to a wider setting to compensate
Scale reading is bouncing	Check for air currents and/or vibration around the scale. If that is the cause, it may be necessary to change the Display Filter parameter.

Error Message	What to Do or Check
[-EEE] [EEE]	Unable to start up. Perform zero calibration (F1.4).
[Err 03]	Eeprom Checksum error. Perform a factory default (F1.11) and recalibrate scale. If this occurs again, return to factory for repair.
[Err 07]	The scale is in continuous motion. Check platform for interference. The load cell may need to be replaced.
[Err 08]	Date / Time data format entry error. Verify correct format (F3.1) and enter again.
[Err 09]	A/D initialization error. Return to factory for repair.

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