Intercomp

CS3000
Users Manual

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Table of Contents

Introduction

This manual contains specifications, operation instructions, and calibration instructions for Intercomp's model CS3000 crane scale.

Specifications

Controls

General:	Zero, lb/kg, Tare Set/Display, Tare clear, On, Off
Display:	5 digit LCD or 5 digit LED
Indicators:	lb, kg, Net

Electrical

Batteries:	8 X D-size disposable alkaline dry cells or rechargeable Nickel-Cadmium cells.
Battery life:	Up to 250 hours with alkaline batteries. Approximately 80 hours on a set of fully charged Ni-Cad cells. (LCD Display)
Resolution:	20 bit A/D delivers over 1,000,000 internal counts.
Filtering:	6 Pole, 10 Hertz low pass.
Auto off:	Low battery, or after adjustable time without use or motion.
Sleep mode:	Display sleep mode after adjustable time without use or motion.
Auto-Zero:	Satisfies all HB-44 requirements; selectable 0.6, 1, or 3 graduations.

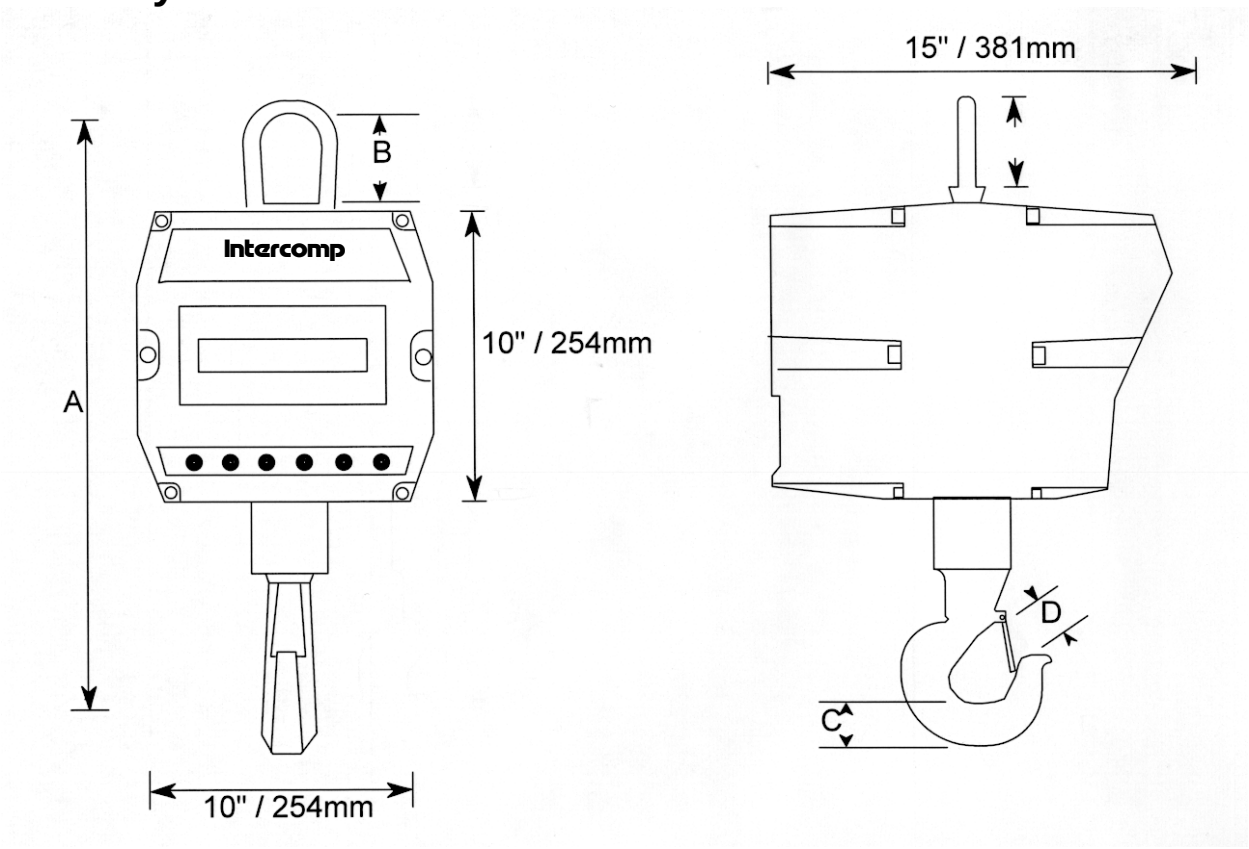
Performance

Accuracy:	±0.1% of applied load or ± display graduation, whichever is greater.

Environmental

Humidity:	10 to 95% Non-Condensing
Temperature:	Storage: -40 C to +75 C. / -40 F to +170 F.
	Operating -10 C to +40 C. / +14 F to +104 F.

Physical



Capacity	Graduation		A	B	C	D		Hook	Eye nut or shackle	Approx. Weight
500 lb 250 kg	0.2 lb 0.1 kg	**in:** **mm:**	19.3 490	3.06 77.7	1.38 35.1	1.34 34.0		C/L 3 ton S1 swivel	C/L #7 eye nut	48 lb 22 kg
2,000 lb 1,000 kg	1 lb 0.5 kg	**in:** **mm:**	19.3 490	3.06 77.7	1.38 35.1	1.34 34.0		C/L 3 ton S1 swivel	C/L #7 eye nut	50 lb 23 kg
5,000 lb 2,500 kg	1 lb 0.5 kg	**in:** **mm:**	22.0 558	3.06 7.77	1.75 44.5	1.69 42.9		C/L 5 ton S1 swivel	C/L #7 eye nut	58 lb 26 kg
10,000 lb 5,000 kg	2 lb 1 kg	**in:** **mm:**	22.0 558	3.06 7.77	1.75 44.5	1.69 42.9		C/L 5 ton S1 swivel	C/L #7 eye nut	58 lb 26 kg
20,000 lb 10,000 kg	5 lb 2 kg	**in:** **mm:**	31.0 787	6.25 159	2.59 65.8	2.25 57.2		C/L 10 ton S1 swivel	C/L # 11 eye nut	97 lb 44 kg
30,000 lb 15,000 kg	10 lb 5 kg	**in:** **mm:**	34.0 863	6.25 159	3.00 76.2	3.00 76.2		C/L 15 ton S1 swivel	C/L # 11 eye nut	122 lb 55 kg
50,000 lb 25,000 kg	10 lb 5 kg	**in:** **mm:**	46.1 1171	6.00 152	3.66 93.0	3.63 85.3		C/L 25 ton S1 swivel	C/L 40 ton #2140	220 lb 100 kg
70,000 lb 35,000 kg	20 lb 10 kg	**in:** **mm:**	48.6 1234	6.00 152	4.56 116	3.75 92.3		C/L 35 ton S1 swivel	C/L 40 ton #2140	248 lb 113 kg
100,000 lb 50,00 kg	20 lb 10 kg	**in:** **mm:**	56.0 1422	7.75 197	5.06 129	4.25 108		C/L 45 ton S1 swivel	C/L 50 ton #2140	392 lb 178 kg

Parts and Optional Equipment

Oversized top lifting eye (100744)
This part is applicable to 500 lb - 10,000 lb capacity models.

Oversized top shackle (100745)
This part is applicable to 20,000 lb and 30,000 lb capacity models.

Oversized top shackle (100746)
This part is applicable to 50,000 lb and 70,000 lb capacity models.

Oversized top shackle (100747)
This part is applicable to 100,000 lb capacity models.

Anti heat shield (100720)
Bottom plate with standard hook rated for 0° - 1000°.

Medium anti heat shield (100670)
1000° - 1500° protection. Includes oversized hook and custom swivel.

Extreme anti heat shield (100671)
1500° - 2500° protection. Includes oversized hook and custom swivel.

Remote load cell input and summing (100724)
Load cell input with electronic summing board. An external load cell can be connected to the CS3000. The scale averages the signals from the 2 load cell outputs.

RS232 Serial data output (100721)
The CS3000 has an RS232 connection so the unit may communicate with a printer or computer.

LED Display (100725)
Optional LED (light emitting diode) display instead of the standard LCD (liquid crystal display) display. An LED display is fully readable in pitch-dark lighting situations.

Anti-magnetic shielding (100722)
Provides protection from high magnetic fields.

Battery pack and 120V external charger (100730)
Rechargeable Ni-Cad battery pack (8 D-cells) with 120V external charger. Standard power uses 8 disposable alkaline dry cells.

Battery pack and 220V external charger (100731)
Rechargeable Ni-Cad battery pack (8 D-cells) with 220V external charger. Standard power uses 8 disposable alkaline dry cells.

Battery pack, Ni-Cad (100733)
D size rechargeable battery pack (qty: 8).

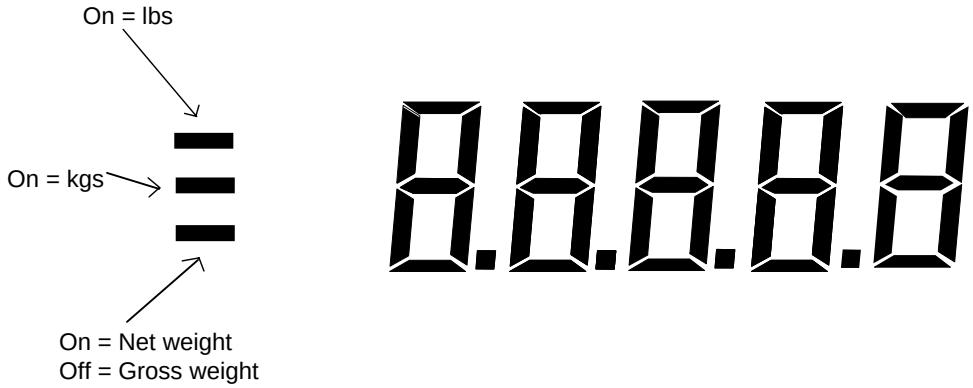
Direct Power on crane unit, 120V (100723)
This option allows the CS3000 to use 120V power instead of batteries.

Direct Power on crane unit, 220V (100727)
This option allows the CS3000 to use 220V power instead of batteries.

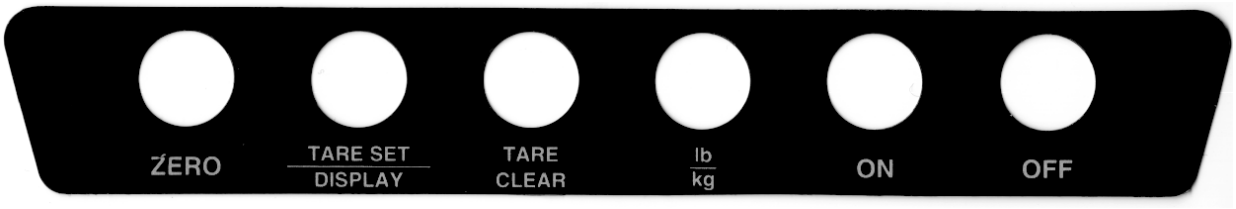
Remote (100752)
Remote controls on , off, zero, and tare.

Operations

Display



Controls



ON

Press this button to turn the scale on. The scale tests itself; when these tests have completed successfully, the system begins weighing.

OFF

Press this button to turn the scale off.

ZERO

Tells the scale to display a zero weight. This button is used any time the scale shows a non-zero value with no weight on the hook. If you press ZERO with weight on the hook, that weight becomes the zero condition for the scale. This can be useful to cancel the weight of any weighing fixtures, such as containers, chains or cables. When this weight is removed, a negative weight shows until the system is zeroed again. The 'zero' command will be delayed any time a change in weight is detected. If there is continuous motion for more than 20 or 30 seconds, the zero command will be rejected and the scale will return to normal weighing.

NOTE: The scale contains a feature called Auto Zero Tracking (AZT), which corrects for slight zero changes during normal operation. If small weights are added slowly, the scale could zero them off.

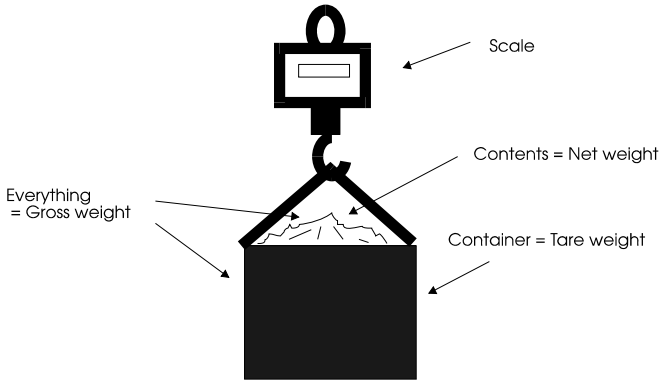
Lb/Kg

Toggles the weighing system between pound (English) and kilogram (SI metric) units of measure. The current unit of measure is shown by the top 2 indicators on the left side of the display.
Note: Switching units clears the saved total and the peak value.

TARE Set/Display

Pressing the TARE key will set the tare equal to the current gross weight and switch the display to net weight. This is shown by the bottom indicator on the left being turned off. The net weight is equal to the gross weight minus the tare weight. The tare weight will only be set if the current gross weight is positive.

NOTE: The 'tare' command will be delayed any time a change in weight is detected. If there is continuous motion for more than 20 or 30 seconds, the tare command will be rejected and the scale will return to normal weighing.



Push-button versus keyboard:
If the CS3000 is configured to have keyboard tare, pressing the tare key will bring up a screen that allows the user to enter a tare value. See the calibration section for how to configure the CS3000 for keyboard tare and how to enter a number. If the keyboard tare is being used the tare value is cleared when switching from pounds to kilograms or kilograms to pounds.

Displaying the tare weight:
If a tare weight is set, pressing the TARE SET/DISPLAY key will display the current value of the tare. The tare will be displayed as long as you hold the key.

Clearing the tare:
Pressing the TARE CLEAR key will reset the tare to zero.

Power/Batteries

Remove the two caps in the back of the unit. Tip the old cells out. Change the cells, being careful to put the positive end in first (The end with the bump). Replace the battery caps.

You may use rechargeable Nickel-Cadmium 'D' cells or standard alkaline 'D' cells in the CS3000.

Warning: If you have the optional charger, do not plug the charger in while there are standard ‘D’ cells inside. This could result in damage to the batteries and your scale.

The typical recharge time for Ni-cad cells is 16 hours. The rechargeable batteries have a life span up to 1000 cycles.

Calibration

How to test the calibration

This calibration procedure should be performed annually for normal operating conditions. If the scale is dropped or damaged, or service has been performed on the scale, use this calibration check.

1. Press the ON switch. The display does a lamp test; during this time the scale does a quick check of itself. Then the weighing system starts weigh mode.
2. Intercomp recommends that you allow the electronics to operate for three minutes after first turning power on. This allows the electronics to become stable for maximum accuracy before you check the calibrations.
3. Make sure no weight is on the hook. Press the ZERO switch. Press the TARE CLEAR key to clear the tare. The weight shown is zero.
4. Apply weights throughout the weighing range, and verify the correct weight (+/- 0.1%) is displayed at each step.
5. If possible apply a weight of 105% of capacity, and verify the scale shows OE on the display.
6. Remove weights and verify the display returns to zero.
7. If there is a failure to meet any of the conditions above, please refer to the Calibration Procedure.
8. When all the conditions above are correct, the scale is operational.

How to enter a number

During this routine you will be asked to enter numbers at many points. The scale will show a number (originally all zeros) with a blinking digit. Press the ZERO key to increase the blinking digit. Press the LB/KG key to move to other digits. When you are finished entering the number press the ZERO and LB/KG keys together.

Three point span

The scale has a three point calibration feature which reduces the effects on non-linearity in the load cells. This requires that you place three weights on the cell during calibration. The first weight must be greater than zero, the second greater than the first, and the final weight somewhere between the second and the capacity.

Calibration switch

The calibration of the scale is protected from accidental change by a switch. The switch is protected by an access plug. The access plug is located on the back of the scale, and is covered by a calibration sticker (seal). The switch is set in the “calibration blocked” mode at the factory.

Enabling the Calibration switch

First, remove the calibration sticker which covers the access plug. Using a ¼” Allen wrench, remove the access plug. Insert the Allen wrench in to the hole and press the switch once. The scale is now set to allow calibration.

How to calibrate the scale

The following details the calibration procedure for the crane scale. There are eight parameters that can be set without moving the calibration blocking switch, followed by five more parameters and calibration that require the calibration blocking switch be in the enabled position.

Step	Display	Parameter	Note	Default
5	EE-00	Sample Rate	1 to 127	8
6	EE-01	Update Rate	1 to 127	2
7	EE-02	Demand Output	1=Yes, 0=Continuous	0
8	EE-03	Baud Rate	0 to 7	0
9	EE-04	Auto-off Time	0 to 255; 0=off	20
10	EE-05	Power up in KG	1=kg, 0=lb	0
11	EE-06	Keyboard Tare	1=keyboard, 0=push-button	0
12	EE-07	Sleep Display Time	0 to 255; 0=off	0
		Information saved		
		Check for calibration blocking switch		
13	EE-08	AZT	0=off,1=0.6,2=1,3=3	2
14	EE-09	Zero Range	0=off,1=on	0
15	EE-10	Canadian Specifications	0=off,1=on	0
16	EE-11	Initial Zero Range	0=off, 1=on	1
17	EE-12	Graduation	0 to 11	6
		Information saved		
18	LL-00	Zero read	Enter capacity	
19	LL-01	First weight	Enter first weight	
20	LL-02	Second weight	Enter second weight	
21	LL-03	Third weight	Enter third weight	
		Information saved		

Start up

1) Move the calibration blocking switch to the 'CAL' position if you intend to calibrate.
2) Turn scale power ON.
3) Wait for scale to warm up (3 minutes from power on).
4) Press ZERO and lb/kg together and release to enter the calibration mode.

First eight parameters

5) The scale shows EE-00. Press the ZERO key Enter the **sample rate** (1 to 127). The sample rate is the number of past readings that are averaged together to make a reading.
6) The scale shows EE-01. Press the ZERO key. Enter the **update rate** (1 to 127). The update rate is the speed at which the displayed weight is updated.
7) The scale shows EE-02. Press the ZERO key. Enter **demand versus continuous** on the optional serial output. This should be set to '0' for the CS3000.

Setting	Type
0	Continuous
1	Demand

8) The scale shows EE-03. Press the enter key. Enter the **baud rate** of the serial output (0 to 7).

Setting	Baud Rate
0	9600
1	4800
2	2400
3	1200
4	600
5	300
6	150
7	75

9) The scale shows EE-04. Press the ZERO key. Enter the **auto off time** (0 to 255). The auto off time is how long the scale will remain <u>on</u> without any activity (a key being pressed or a change in weight). An entry of 0 turns the auto off feature <u>off</u> (The scale would remain on until turned off). The time length of the auto off feature is the number entered divided by two in minutes; an example would be an entry of 10 would be 10/2 = 5 minutes.

10) The scale shows EE-05. Press the ZERO key. Enter what **unit of measure** the scale powers up in:

Setting	Unit setting after power up
0	pounds (lb)
1	kilograms (kg)

11) The scale shows EE-06. Press the ZERO key. Enter which method of **tare** to use:

Setting	Tare type
0	push-button
1	keyboard

12) The scale shows EE-07. Press the ZERO key. Enter the **sleep mode time** (0 to 255). The sleep mode time is how long the scale's display will remain on without any activity (a key being pressed or a change in weight). An entry of 0 turns the sleep mode feature off. The time length of the sleep mode feature is the number entered divided by 2 (minutes). An example would be an entry of 10: 10/2 = 5 minutes. The sleep mode is designed to conserve battery life on scales with an LED display.

Check for calibration blocking switch

- At this point the scale saves any changes that have been made.
- A check is then made to see whether or not the calibration blocking switch is enabled. If enabled the calibration procedure is continued; if disabled the scale returns to normal weighing.

Last five parameters

13) The scale shows EE-08. Press the ZERO key. Enter the **AZT size** (0 to 3). The AZT size is the number of graduations the auto zero tracking can remove.

Setting	AZT size
0	Off
1	0.6
2	1.0
3	3.0

14) The scale shows EE-09. Press the ZERO key. Enter whether the **zero range** is on or off (0 to 1). If the zero range is on, the scale may be zeroed no more than 5% away from the original zero obtained at calibration.

Setting	Zero range
0	Off
1	On

15) The scale shows EE-10. Press the ZERO key. The scale shows the current **Canadian specification** selection. Use the following table to select the Canadian specifications setting. When Canadian specifications is set (1): EE-08, EE-09, and EE-11 have no meaning.

Setting	Canadian Specification
0	Off
1	On

A '0' setting implies normal operation:

1: AZT size is determined by the setting of EE-08.
2: Zero operates over full range allowed by EE-09.
3: The over-capacity point is determined by the setting of EE-11.

A '1' setting implies Canadian specifications are used.

1: The AZT size fixed at 0.6d regardless of EE-08 setting.
2: The IZSM (initial zero setting mechanism on power up) must be within +/- 10% of the zero obtained at calibration.
3: The push-button zero and AZSM can only operate within +/- 2% of the IZSM.
4: The over-capacity point is 103% of capacity above the IZSM.

16) The scale shows EE-11. Press the ZERO key. The scale shows the current **'Initial zero range'** setting. Use the following table to select the 'Initial zero range' setting:

Setting	Initial zero range
0	Off
1	On

A '0' setting implies:

1. The initial zero setting mechanism (IZSM) will work over the entire range of the scale capacity.
2. The over-capacity point is 103% above the zero obtained at calibration.

A '1' setting implies:

1: The IZSM must be within +/- 10% of the zero obtained at calibration.
2: The over-capacity point is 103% above the IZSM.

17) The scale shows EE-12. Press the ZERO key. The scale shows the current **graduation** selection. Use the following table to select and enter a graduation value.

Setting	Count by in lb	Count by in kg
0	100	50
1	50	20
2	20	10
3	10	5
4	5	2
5	2	1
6	1	0.5
7	0.5	0.2
8	0.2	0.1
9	0.1	0.05
10	0.05	0.02
11	0.02	0.01

NOTE: To meet stated accuracy statements, it is suggested that you choose your graduation setting from the table below:

If your capacity is:	Set your graduation to:
500 lb / 250 kg	0.2 lb / 0.1 kg (8)
1000 lb / 500 kg	0.5 lb / 0.2 kg (7)
2,000 lb / 1,000 kg	1 lb / 0.5 kg (6)
5,000 lb / 2,500 kg	1 lb / 0.5 kg (6)
10,000 lb / 5,000 kg	2 lb / 1 kg (5)
20,000 lb / 10,000 kg	5 lb / 2 kg (4)
30,000 lb / 15,000 kg	10 lb / 5 kg (3)
50,000 lb / 25,000 kg	10 lb / 5 kg (3)
70,000 lb / 35,000 kg	20 lb / 10 kg (2)
100,000 lb / 50,000 kg	20 lb / 10 kg (2)

Save

At this point the scale saves any changes that have been made. This allows changes to be made to EE-08 through EE-12 without having to do a complete calibration. The scale can be turned off and any changes so far will be saved.

Weight calibration.

18) The scale shows LL-00. With no weight on hook press the ZERO key. This reads the pad zero. On the next screen, enter the scale's capacity.
19) The scale shows LL-01. Apply the first weight. Press the ZERO key. Then enter the value of the applied weight.
20) The scale shows LL-02. Apply the second weight. Press the ZERO key. Then enter the value of the applied weight.
21) The scale shows LL-03. Apply the third weight. Press the ZERO key. Then enter the value of the applied weight.

Finish

The new calibration information is saved

22) Press the calibration switch ONCE to disable calibration. This will prevent accidental entry into the calibration mode. If you are unsure of whether the switch is enabled or disabled, start going thorough the calibration menu again. With calibration ***disabled***: after the “sleep display time” menu item, the scale should return to normal weighing instead of proceeding to EE-08. *See the “calibration switch” section.*
23) Replace the access plug to cover the calibration switch.
24) Verify the calibration.
25) Calibration complete.

Serial Output (Optional)

The CS3000 can be connected to output to a scoreboard (continuous).

The signal comes out of the Serial I/O connector located on the side of the unit. The connector has the following pinout:

Signal	Pin
TXD	F
GND	B

The transmitted signal has the following characteristics:

Fixed 8 Data bits, no parity, 1 stop bit.
Baud rate is configurable under EE-03, see calibration section.
The output swings from -9 VDC to 9 VDC.

Scoreboard

The scoreboard output is an externally available signal designed to drive a numeric overhead display board or a computer's RS-232 input.

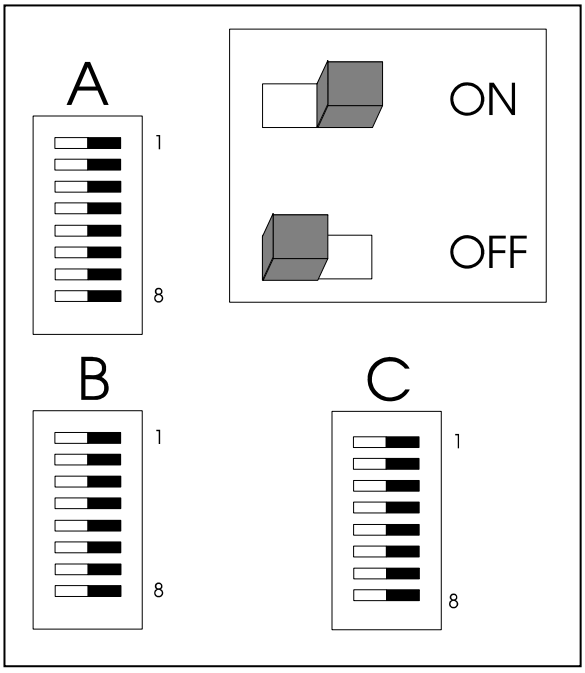
Transmitted data: #xxxxxxx>0@<cr><lf>

This represents the NET or GROSS weight, whichever is currently shown on the CS3000 display. This data is repeatedly sent out about five times a second, with the exception that the transmission is delayed whenever there is motion.

The xxxxxxx field will vary in length depending on the length of the number and could contain a decimal point and/or a minus sign.

Item	Meaning	ASCII Hex	ASCII Decimal
#	start character	23	35
xxxxxxx	data		
>	separator	3E	62
0	data identifier	30	48
@	end character	40	64
<cr>	carriage return	0D	13
<lf>	linefeed	0A	10

The scoreboard is designed to work with Intercomp's S400 (4 inch) and SA2000 (2 inch) scoreboards. The following describes how to configure the S400 or SA2000 to work with the scoreboard output.



The above diagram is the S400 switch pack layout, The SA2000 has pack C below B. The switch is to the right for on and to the left for off.

Switch #	Pack A	Pack B	Pack C
1	OFF	OFF	See next page
2	ON	ON	"
3	ON	OFF	"
4	ON	OFF	"
5	ON	ON	ON
6	OFF	ON	ON
7	OFF	ON	OFF
8	ON	ON	OFF

The above switches should be set on switch packs A, B, and C.

Pack C, SW 1 to 4:

Baud Rate	C-1	C-2	C-3	C-4
9600	ON	ON	ON	OFF
4800	OFF	ON	ON	OFF
2400	ON	ON	OFF	OFF
1200	OFF	OFF	ON	OFF
600	ON	OFF	OFF	ON
300	OFF	ON	OFF	OFF
150	ON	OFF	OFF	OFF
75	OFF	OFF	ON	ON

The connection to an Intercomp S400 display is:

CS3000	S400
TXD (F)	2 (RXD)
GND (B)	7 (GND)

The connection to an Intercomp SA2000 display is:

CS3000	SA2000
TXD (F)	3
GND (B)	7

The connection to a 9-pin PC communication port is:

CS3000	PC 9-pin
TXD (F)	2
GND (B)	5

Note: For some setups it may be necessary to jump pins [6, 1, and 4] together, and pins [7 and 8] together on the PC port connector.

The connection to a 25-pin PC communication port is:

CS3000	PC 25-pin
TXD (F)	3
GND (B)	7

Note: For some setups it may be necessary to jump pins [6, 8, and 20] together, and pins [4 and 5] together on the PC port connector.

How to reach Intercomp Service

Things to know:

1. The service is for a CS3000 crane scale.
2. When did you purchase your scale?
3. What is your serial number?
4. Whom did you purchase the scale through?

For Intercomp Service call or fax:

FAX # (612)-476-2613
(612)-476-2531
1-800-328-3336

or fill out Service Support form at:

www.intercompco.com