CAMBRIDGE

SCALE WORKS INCORPORATED

MODEL: CSW-15AT-B
DIGITAL WEIGHT INDICATOR

INSTALLATION, SET-UP & OPERATION

COC # 06-070A1

MEASUREMENT CANADA
AM-5778C

Made in USA

Cambridge Scale Works. • P O Box 670 • Honey Brook, PA 19344
(800) 292-7640 • (610) 273-7040 • www.cambridgescale.com

MANUAL P/N 5999-1025-01 (2/14)

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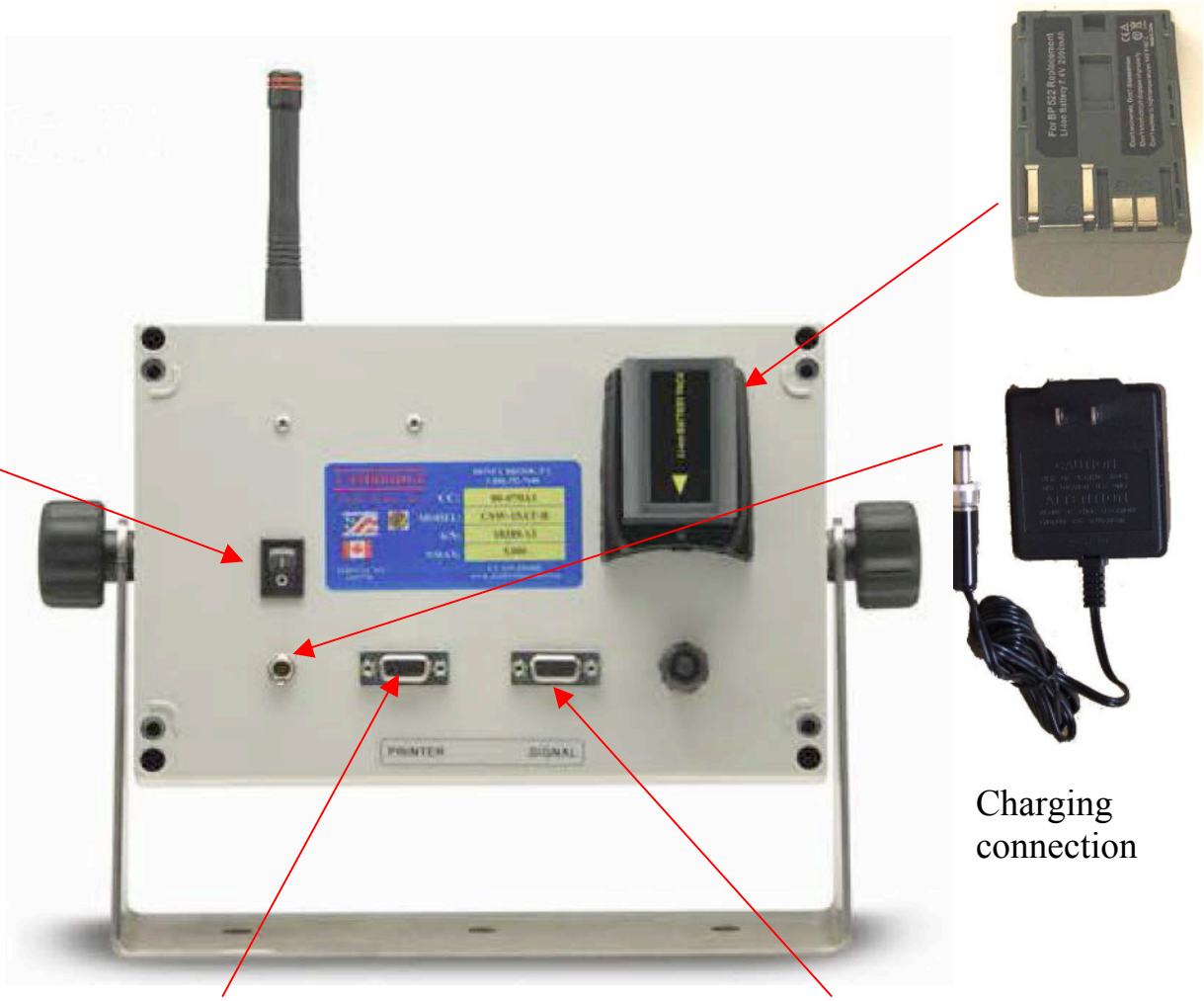
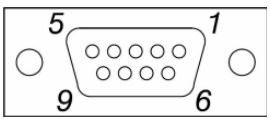
METER CONNECTIONS

To connect power via AC wall adapter cable to the CSW-15AT-B meter. First make sure the On/Off switch on the rear of the meter is in the off position. Connect the wall adapter to your 110VAC outlet. Next, connect the other end of the cable to the connector on the rear of the indicator.

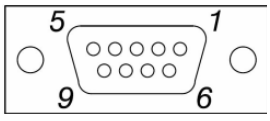


COMMUNICATIONS PORT



Pin # Description
1 ------ Shield
2 ------ RXD
3 ------ TXD
4 ------ +5V
5 ------ SGND

SIGNAL



Pin # Description
1 ------ +EXC
2 ------ -SIG
5 ------ Shield
6 ------ -EXC
7 ------ +SIG

1.0 OPERATION

1.1 Charging The Battery:

When the battery voltage falls to 6.5VDC, as described previously, ***bAt LO*** will be displayed continuously. The battery needs to be charged at this time.

With the On/Off switch in the OFF position, connect one end of the power adapter to a 110VAC outlet. Next, connect the other end of the adapter to the power jack on the rear of the meter. The charge indicating led will be orange while the battery is being charged and turns green when the battery is fully charged. Turn the On/Off switch to the ON position and the meter will be fully operational as the battery is being charged.

CHARGE INDICATING LED

1.2 Key Functions:

ZERO — Brings the scale to a zero balance reading. If the ***ZERO*** key is pressed and held for 5 seconds the Calibration zero value will be displayed.

GRS/NET — Toggles the display between Gross weight and Net weight. This key is also used to enter Setup & Calibration Mode. To enter press and hold this key until the Parameter (***P xxx***) Event counter is displayed, then release. Immediately after ***CodE*** is displayed, enter in sequence (within 5 seconds) ***TARE***, ***lb/kg***, ***GRS/NET***, and ***PRINT/ENTER***. The display will indicate ***ScAlE*** and you are now in Setup & Calibration mode.

Note: P xxx and C xxx are event counters that will increment each time one or more changes are made to the Scale or Calibration Parameters.

TARE — Enters the Gross weight value into the Tare display and switches to the net display mode. If the ***TARE*** key is pressed and held for 5 seconds the current Tare value will be displayed.

Lb/kg — Toggles the display between pounds and kilograms.

1.3 Error Messages:

ScnEg — When the weight is more than 10 divisions negative from the zero calibration point.

OLD — The scale is in an overload condition.

BAtLo — Will flash when the battery voltage falls to 10.8VDC and will be displayed constantly when the voltage falls to 10.2VDC.

Err d — More than 5000 scale divisions have been selected in ***S1*** Ntep or ***S1*** Angle mode. More than 20,000 scale divisions have been selected in ***S1*** No Mode.

1.4 Numeric Entries:

Once you have entered Setup and Calibration mode, (as described on the previous page) some entries may require entering a numeric value.

To enter a numeric value:

1. Press and release the ***lb/kg*** key to move into the desired menu field
2. Press and release the ***ZERO*** key, the first digit will begin to flash
3. Use the up and down arrow keys to increase or decrease the value of this digit until you reach the desired value.
4. Press the ***TARE*** key to move to the next digit and repeat step 3.

When you are satisfied with the value of each digit press the ***PRINT/ENTER*** key to save your entry and return to the menu.

1.5 Setup Parameters:

To begin press and hold this key until the Parameter (***P xxx***) Event counter is displayed, then release. Immediately after ***CodE*** is displayed, enter in sequence (within 5 seconds) ***TARE***, ***lb/kg***, ***GRS/NET***, and ***PRINT/ENTER***. The display will indicate ***ScAlE*** and you are now in Setup & Calibration mode.

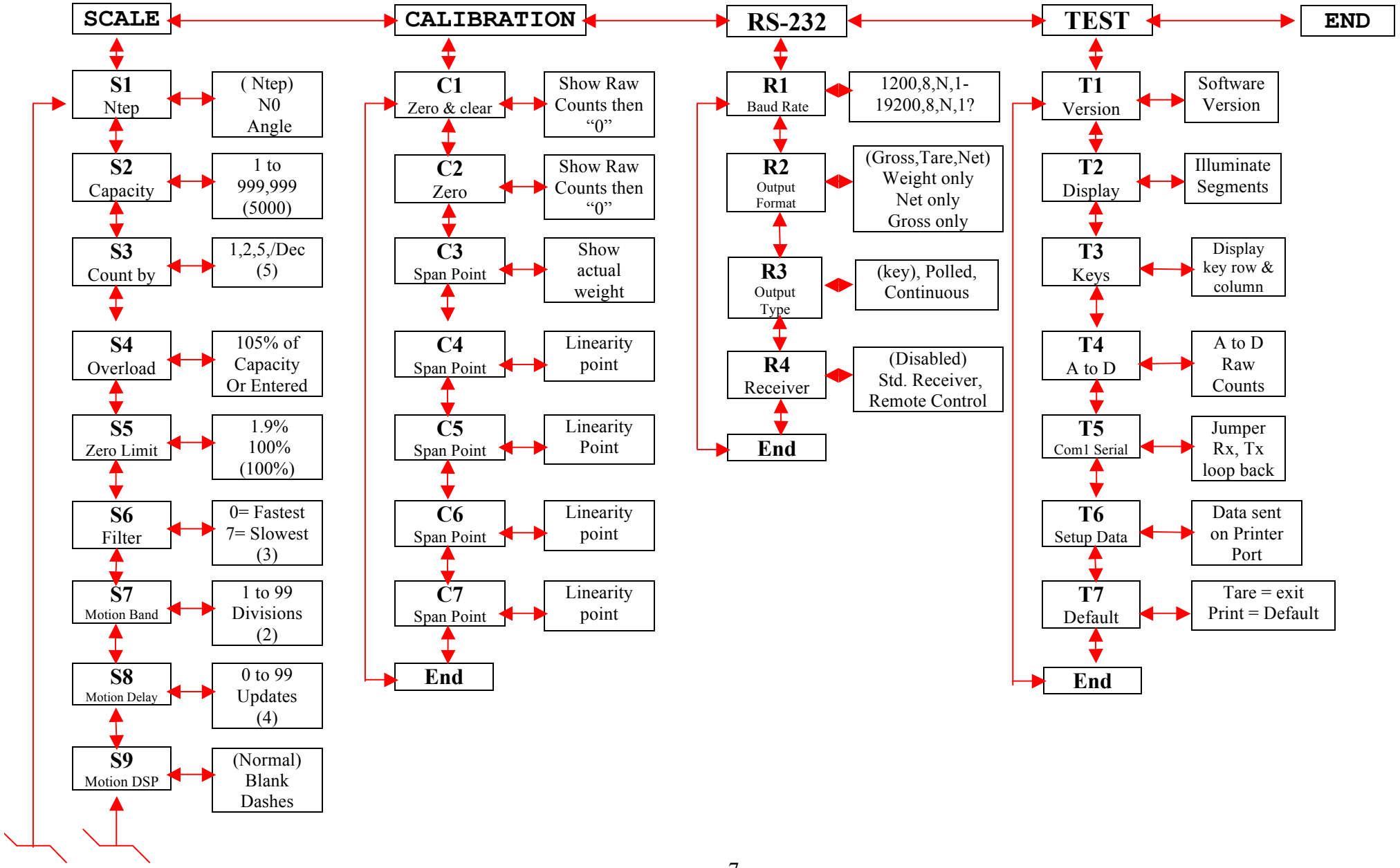
Note: P xxx and C xxx are event counters that will increment each time one or more Changes are made to the scale Scale or Calibration Parameters.

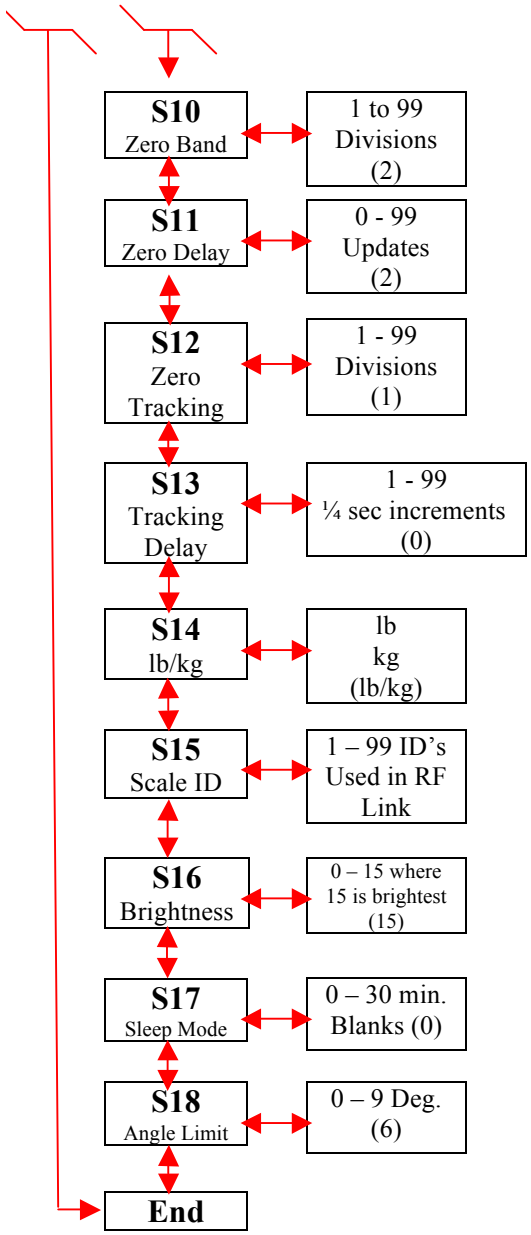
With the display indicating ***ScAlE***, press the ***GRS/NET*** key to move down to change a parameter. This allows the operator to change any one of the Scale Parameters S1 thru S18. For example, press the ***GRS/NET*** key to move down until ***S2*** is displayed, ***S2*** is used to set the capacity of the scale. Press the ***lb/kg*** key to move right into the ***S2*** parameter. The current capacity will be displayed. Press the ***ZERO*** key; the first digit will begin flashing. Enter the new capacity using the steps described in section 1.4 shown at the top of the page. Once you have the capacity entered, press the ***PRINT/ENTER*** key to enter the value and return to ***S2***.

The same steps can be followed to enter the count by. Press the ***GRS/NET*** key to move down until S3 is displayed. Press the ***lb/kg*** key to move right into the ***S3*** parameter. The current Count By will be displayed. Use the up and down arrow keys to increase or decrease the value. Use the left and right arrow keys to adjust the decimal point. When the desired Count By is entered, press the ***PRINT/ENTER*** key to enter the value and return to ***S3***.

2.0 SCALE PROCEDURE

2.1 Software Navigation Flowchart:





2.1 Software Navigation Flowchart:

During setup you will be required to enter make numeric entries.(Ex: Capacity, Zero Band, etc…) The following table outlines the keys used to perform these entries along with their function.

ZERO ---------- Key is used to move up.
GRS/NET --------- Key is used to move down.
lb/kg ---------- Key is used to move right.
TARE ---------- Key is used to move left.
PRINT/ENTER --- Key is used to enter data.

2.2 Scale Menu Definitions:

Enter Calibration / Setup mode by pressing and holding the ***GRS/NET*** key until Parameter (***Pxxx***) event counter is displayed, then release. Immediately after ***CodE*** is displayed, enter in sequence (within 5 sec.) ***TARE***, ***lb/kg***, ***GRS/NET***, and ***PRINT/ENTER***. ***ScAlE*** will be displayed. Press the down arrow key to enter the scale menu. Press the right arrow key to enter each sub menu.

-P xxx, C xxx are event counters that will increment each time one or more changes are made to the Scale or Calibration Parameters.

S1 Ntep **(Ntep):** Maximum divisions limited to 5000 negative
Scale negative message is displayed if the gross weight goes more than 10 divisions below zero. If a capacity and count by of more than 5000 divisions is selected ***Err d*** will be displayed, then you will be returned to S2 to select a new capacity and count by.
Angle: Enables angle correction for Legal For Trade Lift truck scales.
No: 20,000 maximum division limits and no scale negative tests.

S2 Capacity 1 to 950,000 pounds. 5000 (Default)

S3 Count By .0001, .001, .01, .1, (1), 10, 100
.0002, .002, .02, .2, 2, 20, 200
. 0005, .005, .05, .5, 5, 50, 500

S4 Overload (105%) of the scale capacity or user entered value.

S5 Zero Limit (100%) or 1.9% of scale capacity.

S6 Filter 0 to 7, Where 0 is the fastest response and least filtering and 7 is the lowest response or most filtering. 3 (Default)

S7 Motion Band 1 to 99 divisions. The weight display must be stable within the selected number of divisions for the motion indicator to be turned off. 2 (Default)

S8 Motion Delay 0 to 99 updates. The weight display must be within the motion band for the selected number of updates in order to turn off the motion indicator. 4 (Default)

S9 Motion Display **(**Normal): When the scale is in motion the motion LED will aluminate.
Blank: When the scale is in motion the display will be blanked out.
Dashes: When the scale is in motion the display will show all dashes.

S10 Zero Band 1 to 99 divisions. The weight display must return to zero within the selected number of divisions to be considered zero. 2 (Default)

2.2 Scale Menu Definitions Continued:

S11 Zero Delay 0 to 99 updates. The weight display must be within the zero band for the selected number of updates to be considered zero. 4 (Default)

S12 Zero Tracking
0 0.5 divisions.
(1) 1 division. (Default)
2 3 division
Press the right arrow key to enter. Use the up and down arrow keys to make the desired selection (0, 1, or 2), then press the ***PRINT/ENTER*** key to save and exit. S12 will be displayed.

S13 Tracking Delay 0 to 99 updates. The amount of time that the display within the allowed graduations before it will automatically be zeroed. 10 (Default)

S14 lb/kg **(lb/kg)**: Allows the indicator to be switched between pounds and kilograms by pressing the ***lb/kg*** key.
LB: This sets the display to pounds only.
Kg: This sets the display to kilograms only.

S15 Scale ID 1 to 99 Scale ID used in RF link output. 1 (Default)

S16 Brightness 0 to 15. Adjusts the LED display intensity where 15 is the brightest. 15 (Default)

S17 Sleep Mode 0 to 30 minutes. The display will turn off after the set time elapses with no scale activity. 0 (Default).

S18 Angle Limit 1 to 9 Degrees. 6 (Default).

END Exits back to the main menu

( ) indicates factory set defaults unless otherwise specified.

3.0 CALIBRATION PROCEDURE

3.1 Calibration Menu Definitions:

C1 Zero All

Raw counts, (Pitch and Roll if in angle mode) will be displayed. When ***ZERO*** is pressed an analog zero is done and all calibration span points will be cleared.
If the indicator is in angle mode the Pitch and Roll offsets will also be Zeroed.

C2 Zero

Zeroed raw counts, (Pitch and Roll if in angle mode) will be displayed. When ***ZERO*** is pressed an analog zero is done and all calibration span points will NOT be cleared.
If the indicator is in angle mode the Pitch and Roll offsets will be Zeroed.

C3 Span Point

The last Calibration weight will be displayed then the actual Weight on the scale will be displayed.
If you do not wish to change the span point, press the ***TARE*** key to exit without making any changes.
If the displayed weight does not match the known test weight, use the numeric keypad to enter the correct weight. Press the ***PRINT/ENTER*** key to save and exit. The display will return to C3.

C4-C7 Span Points

C4 to C7 are for linearity correction. They can be used in order and in any quantity or not at all if no correction is necessary.
C4 to C7 may be entered at any time without affecting the original calibration points.
The last calibration weight will be displayed then the actual weight on the scale will be displayed. If no calibration weight has been entered at this span point "***notset***" will be displayed then the actual weight on the scale is displayed.
If the displayed weight does not match the known test weight, follow the steps described for C3 Span Point on adjusting the weight and entering the value.

END

Exits back to the main menu

3.2 Calibration:

Press and hold the ***GRS/NET*** key, as described previously in section 1.5. ***ScAlE*** will be displayed. Press the ***lb/kg*** key to move right until ***CalIb*** is displayed. Press the ***GRS/NET*** key to move down, ***C1*** will be displayed. Press the ***lb/kg*** key to move right, The raw counts will be displayed. With no weight on the scale and the scale level, press the ***ZERO*** key, "0" will be displayed. Press the ***PRINT/ENTER*** key to save the Entry. "0" is now entered and the display will return to ***C1***.

Note: With the scale completely level use C1 or C2 to zero the angles. There is No need to use both C1 and C2.
C1 will establish zero and clear all span points
C2 will establish zero and without clearing all span points

Press the ***GRS/NET*** key to move down until ***C3*** is displayed. Press the ***lb/kg*** key to enter. The last calibrated weight will flash then the current weight on the scale is displayed. Place a known test weight on the scale, with the scale level. Using the steps described in section 1.4, for a numeric entry, enter the actual weight and press the ***PRINT/ENTER*** key to save and exit. The display will return to ***C3***.

3.3 Linearity Correction:

If Linearity Correction is needed, Press the ***GRS/NET*** key (from the Calibration menu) to move down until ***C4*** is displayed. Press the ***lb/kg*** key to move right, the last calibrated weight will flash or "***notset***" will flash if this point has not been previously set. Next, the current weight on the scale will be displayed. Place a different known test weight (not the same test weight that was used for ***C3***) on the scale. Using the steps described in section 1.3, for a numeric entry, enter the actual weight and press the ***PRINT/ENTER*** key to save and exit. The display will return to ***C4***. Repeat these steps for ***C5***, ***C6*** and ***C7***.

Linearity Correction points (***C4-C7***) can be used in any order and in any quantity or not at all if no correction is necessary. After calibration is complete you may return to these correction points and make changes to its value without affecting any of the original calibration points.

4.0 COMMUNICATIONS SETUP

4.1 Communications Menu Definitions:

R1 Baud Rate 1200 to 115200 baud (9600) Default.8, n, 1

R2 Output Format

0 Gross, Tare, Net (Default)
"CR, LF, CR, LF [32 bytes of 2Eh], CR, LF, CR, LF, Gross (lb or kg), :, six ASCII characters [indicated weight], CR, LF, Tare (lb or kg), sp, :, six ASCII characters [indicated weight], CR, LF, CR, LF, CR, LF, CR, LF" [100 bytes total output].
kg),

1 (Weight only) "Six ASCII characters [indicated weight], CR, CF" [8 bytes total output].

2 (Net only) "NT, Sp, Six ASCII characters [indicated weight], Sp, lb or kg, CR, LF" [14 bytes total output].

3 (Gross only) "GR, Sp, Six ASCII characters [indicated weight], Sp, lb or kg, CR, LF" [14 bytes total output].

R3 Output Type

0 Output on command. Standard Print. **(**Default**)**
Output as selected by R2 Output Format. If "Q" is received on the serial port the scale will output the same as if the ***PRINT/ENTER*** key is pressed. The same holds true for:
Z = ZERO
U = lb/kg,
D = GRS/NET
T = TARE

1 Slave Display output (numeric only) continuous Stx, Six ASCII Characters (indicated weight), CR, LF (9 Bytes total output).

2 Slave Display output (alphanumeric) continuous Stx, GR, NT, or TR, Six ASCII Characters (indicated weight), lb, kg, CR, LF [15 bytes total output].

3 RF Link Output.

4 Used for QSI Terminal.

R4 Receiver

0 Disabled (Normal Scale Mode). (Default)

1 Standard Receiver. Receives R3-3 RF Link output string, displaying data as it appears on the scale. All keys are disabled with the exception of the ***PRINT/ENTER*** Key. Pressing the ***PRINT/ENTER*** key will cause this port to print.

2 Remote control. Receives R3-3 RF Link output string, displaying data as it appears on the scale and allows full control of all scale meter functions.

END Exits back to main menu

( ) Indicates Factory default setting

5.0 TESTING PROCEDURES

5.1 Testing Menu Definitions:

T1	**Software Version**	Displays the software version. Press ***PRINT/ENTER*** to exit.
T2	**Display**	Flashes all display segments then all indicating Enunciators. Press ***PRINT/ENTER*** to exit.
T3	**Keys**	Press the ***ZERO*** key, b1 will be displayed. Press the ***GRS/NET*** key, b2 will be displayed. Press the ***TARE*** key, b3 will be displayed. Press the ***lb/kg*** key, b4 will be displayed. Pressing the ***PRINT/ENTER*** will exit back to the menu ***T3***.
T4	**A to D**	Displays Raw counts where a 1mV/V signal from the scale will display 25,000 counts. When the indicator is in angle mode, Press the ***GRS/NET*** key to cycle Pitch, Roll and Raw counts. Press the ***PRINT/ENTER*** Key to exit.
T5	**Serial**	Serial Communications can be verified by connecting pins 2 and 3 on the serial port. A single character will be echoed and pass or fail will be displayed. Press the ***PRINT/ENTER*** key to exit.
T6	**Setup Data**	Setup data will be sent out on the printer port.
T7	**Default**	Resets the indicator back to the factory settings. This will clear all calibration and setup data. “r you sure?” will be displayed. Press the ***TARE*** key to exit without Defaulting, or press the ***PRINT/ENTER*** key to reset the indicator to the factory default settings.

6.0 WARRANTY

CAMBRIDGE warrants the CSW-15AT-B to be free of defects in workmanship and/or materials for 12 months from the date of shipment. This warranty of workmanship and/or materials is valid, if in the opinion of **CAMBRIDGE** the equipment has not been mechanically, environmentally, or electrically abused.

This warranty is limited, at the option of **CAMBRIDGE**, to repair, replace or an appropriate credit adjustment, not to exceed the original equipment sale price paid to **CAMBRIDGE**. **CAMBRIDGE** assumes no liability in connection with the sales of its products beyond that stated above.

Warranty replacement parts and or repair services are performed at the factory in Cumberland, Maryland or by an authorized service group approved by **CAMBRIDGE**.

Warranty does not include travel expense if a factory technician is requested to perform repairs at a location other than the factory.

It is the user's responsibility to follow the proper set-up, calibration and operating procedures of the **CSW-15AT-B** as described in this manual. If the operator has difficulty using their **CSW-15AT-B** Properly, please contact **CAMBRIDGE** at 1-301-724-4082. Any one of our Technicians will be happy to work with the user via telephone.

Thank You!

7.0 ASSISTANCE

If at any time and you require assistance with your **Model: CSW-15AT-B** Indicator:

End User please contact your servicing scale dealer.

Authorized Cambridge Dealer/ Distributor please contact:

CAMBRIDGE SCALE WORKS, INC.
115 West Mary Street
Cumberland, MD 21502

Phone: (301) 724-4082
Fax: (301) 724-4964