SURVIVOR® CW-80

Checkweigher

Supervisor's Operating Guide

RICE LAKE WEIGHING SYSTEMS
Industrial Solutions on a Global Scale®

ISO 9001 REGISTERED

33752

Contents

Purpose of this Guide:

These instructions are provided to allow a plant supervisor to do minor external programming and establish product ID registers prior to an operator taking over the daily operation of the CW-80 Checkweigher. The instructions assume a qualified scale technician has installed, configured, and calibrated the unit. In nearly all cases, the supervisor's programming can be done without entering the Setup mode. If necessary to enter the Setup mode, contact the qualified scale technician who installed, configured, and calibrated the CW-80.

An Operator's Card is included for the end user, and should be left with the unit. This card gives basic weighing instructions for an operator using the CW-80 in one of two TARGET operating modes. One side of the card is used for TARGET applications in which pushbutton tares are enabled. The other side should be used for TARGET operating mode in which tares are entered digitally with front panel keys.

The Operator's Card assumes that the supervisor has established all product ID registers, and has made them "read only" registers that cannot be changed by the operator.

Scope of this Guide:

Using these instructions and working entirely in Operating mode through the front panel keys, a supervisor can:

- Establish and store up to 299 separate product ID registers—each with its own ID number, ACCEPT tolerance band, tare value, and unit of measure
- Modify existing product registers
- Set the Over/Under arrowhead displays into a customized bar graph configuration

For advanced setup, installation, and operation of the CW-80 requiring entering the indicator enclosure, consult the *CW-80 Installation and Service Manual,* or contact your qualified scale technician who installed, configured, and calibrated your CW-80.

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1. Key and Display Functions

Overview

The CW-80 Checkweigher is a high-speed scale programmed to compare weight readings to pre-set tolerance limits that define an ACCEPT range. Any weight placed on the scale will be displayed as either within the ACCEPT range, or in an UNDER or OVER state. The degree that a weight is under or over the acceptable tolerance can be indicated by arrowheads lighting sequentially in a display like a bar graph.

ACCEPT Weight Range

If a weight placed on the scale falls within the acceptable range set, the green “ACCEPT” display lights.

UNDER Weights

If the weight on the scale is at least one graduation below the acceptable range, “ACCEPT” is off and one or more of the red “UNDER” arrowheads light. The sequence in which the arrowheads light indicates how far under acceptable the weight on the scale is:

When the weight on the scale is just under the acceptable range, the red “UNDER” arrowhead closest to ACCEPT lights.

If the weight is further beneath the acceptable range, both red “UNDER” arrowheads light.

If the weight on the scale is greatly under the acceptable range, only the furthest red “UNDER” arrowhead lights.

OVER Weights

If the weight on the scale is at least one graduation above the acceptable range, “ACCEPT” is off and one or more of the amber “OVER” arrowheads light. The sequence in which the arrowheads light indicates how far over acceptable the weight on the scale is:

When the weight is just over the acceptable range, the amber “OVER” arrowhead closest to ACCEPT lights.

If the weight is further above the acceptable range, both amber “OVER” arrowheads light.

If the weight on the scale is greatly over the acceptable range, only the furthest amber “OVER” arrowhead lights.

Accessing Setup Mode:

Contact your installer or other qualified scale technician for information on accessing the CW-80 Setup mode.

By factory-set defaults, the different arrowhead displays are set to light at 3 grad intervals from each other. Those settings can be altered in the Setup mode, under the OPERATE submenu.

Key Functions

ZERO key

The **ZERO** key sets the current Gross weight to Zero.

UNITS key

The **UNITS** key switches the display to an alternate unit of measure if alternate units have been established.

PRINT key

The **PRINT** key sends “on-demand” data out the serial port.

TARE key

The **TARE** key can be set to work in one of three modes:

SET Mode
Pressing the **TARE** key displays the current tare value. That value can then be changed numerically using keypad buttons.

Ptt (push to tare) Mode
Pressing the **TARE** key acquires the weight on the scale as the current tare value. If pressed at zero gross weight, current tare value is removed.

OFF
Disables the tare function. Entry of tare values is ***not*** permitted.

OVER key / UP ARROW key

OVER key
The **OVER** key displays the current “Over tolerance” value, which is a weight just outside the upper limit of the ACCEPT band.

UP ARROW function of key
When changing numerical values, pressing this key establishes an upward direction for increasing the displayed value. Disabling the **OVER** key does not disable the **UP ARROW** function of the key.

UNDER key / DOWN ARROW key

UNDER key
The **UNDER** key displays the current “Under tolerance” value, which is a weight just outside the lower limit of the ACCEPT band.

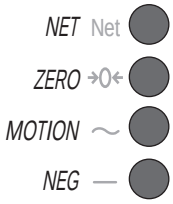
DOWN ARROW function of key
When changing numerical values, pressing this key establishes a downward direction for decreasing the displayed value. Disabling the **UNDER** key does not disable the **DOWN ARROW** function of the key.

TARGET key

When the CW-80 is set up in Target operating mode, pressing the **TARGET** key acquires the weight on the scale as the desired target value. The CW-80 then computes the Under and Over values around this target value based on tolerance settings defined in the Setup mode.

ID key

The **ID** key is used to call up and activate a particular ID number and its Over/Under/Tare/Units register. The **ID** key is also used to store an ID with its Over/Under/Tare/Units register.



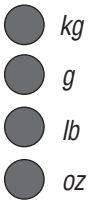
NET, ZERO, MOTION, NEG Annunciator Lights

NET
Indicates that the CW-80 is in the Net Weight display mode.

ZERO
Indicates that the current displayed weight reading is within ±0.25 display division (dd) of Zero.

MOTION
Indicates that the weight reading is unstable because the scale is “in motion”.

NEG
Indicates that the displayed digits represent a negative value.



kg, g, lb, oz Annunciator Lights

kg
Indicates the unit of measure is kilograms.

g
Indicates the unit of measure is grams.

lb
Indicates the unit of measure is pounds.

oz
Indicates the unit of measure is ounces.

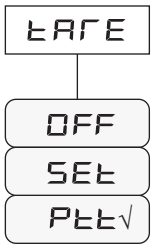
lb/oz
When both the “lb” and “oz” lights are illuminated, indicates that the unit of measure is pounds and ounces.

2. Establishing Tares

Overview

The TARE function can be disabled (**OFF**), set to function as a push-to-tare **(PTT)** that acquires the weight on the platter when the **TARE** button is pushed, or can be set so tare values are entered digitally with keypad buttons **(SET)**.

In either case, if you are setting up ID registers for multiple products—each with its own ID, Tare, Units, and ACCEPT tolerances—you may wish to ensure that the operator does not accidentally change the Tare values during operation. You can do that by disabling the TARE key after you have set up all ID registers, but before turning the CW-80 over to the operator. You must be in the Setup mode to turn the TARE key OFF. Contact your installer or other qualified scale technician for information on accessing the CW-80 Setup mode.

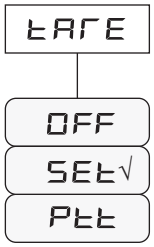


PTT Operation

With platter empty, be sure ZERO annunciator light is on. If not, press **ZERO** button.

Place the desired object to be tared off on the platter. Press **TARE** to store the weight value of the object.

The CW-80 will shift into Net mode and the display will show 0. If the platter is empty and the scale is at gross zero, pressing the **TARE** key will remove any previously entered tare weight.



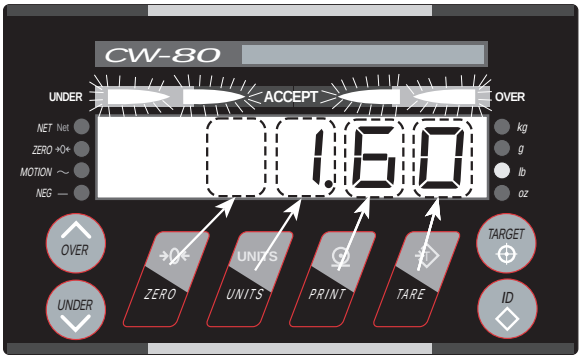
SET Operation

Press the **TARE** key to display the current tare value.

All Under and Over arrowheads will flash to indicate that the CW-80 is in the Tare Display/Set mode. This mode lasts for only 3 seconds unless a key is pressed, which resets the 3-second time interval.

If you want to increase the displayed value, press **OVER (up)** to establish the direction. If you want to decrease the value, press **UNDER (down)**.

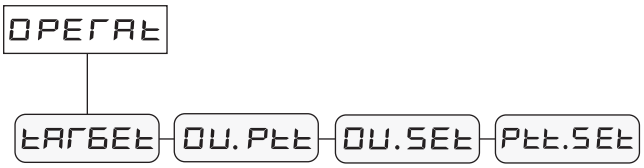
Use the four keys beneath the first four digits to change the value. Each single press of a key will increment (if you pressed **OVER**) or decrement (if you pressed **UNDER**) the digit above that key.



When the desired value is displayed, press the **ID** or **TARGET** key (or wait 3 seconds without a keypress). The CW-80 will store the new value then shift back into Normal Weighing mode.

3. Setting ACCEPT Band Tolerances

Overview



The CW-80 allows a choice of four ways to set the upper and lower limits of the ACCEPT band. The parameter chosen under the OPERATE menu (while in the Setup mode) determines how the limits of the ACCEPT band are set. Once the parameter is chosen, the actual ACCEPT band limits are set while in the Normal Weighing mode.

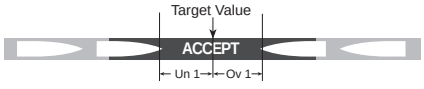
Depending on your application, you may want to allow the operator to establish or change ACCEPT band limits. Alternately, you may want to set up these limits yourself then lock the operator out of this setting function to prevent accidental change of the limits you have set. There are several ways you can use to lock out the operator from changing settings. See Section 4 of this guide for more information.

Accessing Setup Mode:

Contact your installer or other qualified scale technician for information on accessing the CW-80 Setup mode.

TARGET Operating Mode

This mode is useful in applications where many different products are to be checkweighed, all having the same ACCEPT band tolerances. An example might be in a meat packing plant where a production line checkweighs 10 lb, 12 lb, and 15 lb packs, all having an ACCEPT tolerance of - 0.00 lb, + 0.20 lb.



To assign the same tolerance for many different weights, the ACCEPT band for this operating mode must be set in grads, rather than weight. These grad settings are made in the Setup mode as submenu items under the TARGET parameter. The lower limit of the ACCEPT band is set with “Un 1” in the submenu, and the upper limit with “Ov 1”.

Using the above meat packing example with a 30# scale and a 0.01# grad size, “Un 1” should be set to 1 grad (0.01 lb), and “Ov 1” should be set to 21 grads (0.21 lb). The ACCEPT band will then be applied to the target weight with a tolerance of -0.00 lb, +0.20 lb.

NOTE:

*In the TARGET mode of operation, the operator can use the **OVER** and **UNDER** front panel keys to temporarily override the established settings for Un 1 and Ov 1. These new settings will remain active until the **TARGET** key is pressed again, or until the CW-80 is powered down. If you want to lock out the operator from overriding Un 1 and Ov 1 settings you have stored with an ID register, the **OVER** and **UNDER** keys can be disabled in the Setup mode.*

TARGET Operation Instructions

Using the same example with a 30# x 0.01# scale with - 0.00, +0.20 tolerances, if weighing 10 lb packs:

Place a certified 10 lb weight on the platter and press **TARGET** key.

This sets the ACCEPT band from 10.00 lb to 10.20 lb.

Any number of weighments can be made with these stored values. The values will remain active until **TARGET** key is pressed again.

If changing to 12 lb packs, place a certified 12 lb weight on the platter and press **TARGET** key.

This sets the ACCEPT band from 12.00 lb to 12.20 lb.

Any number of weighments can be made with these stored values.

If changing to 15 lb packs, place a certified 15 lb weight on platter and press **TARGET** key.

This sets the ACCEPT band from 15.00 lb to 15.20 lb.

OU. PTT Operating Mode

In OVER/UNDER PUSH TO TOLERANCE mode, the operator sets the limits of the ACCEPT band with actual weights placed on the scale.

The lower limit is set by placing an unacceptably-low weight on the platter and pressing the **UNDER** key. This sets the point where the first Under arrowhead will come on.

The upper limit is set by placing an unacceptably-high weight on the platter and pressing the **OVER** key. This sets the point where the first Over arrowhead will come on.

Any weights which fall between those limits are in tolerance and will light the ACCEPT display.

NOTE:

*The **TARGET** key is automatically disabled when the CW-80 is in OU. PTT mode.*

OU. PTT Operation Instructions

Place weight on the platter equal to where you want the lower limit of the ACCEPT band to be (where the first Under arrowhead will light) and press the **UNDER** key.

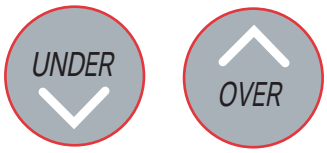
Place weight on the platter equal to where you want the upper limit of the ACCEPT band to be (where the first Over arrowhead will light) and press the **OVER** key.

Any number of weighments can be made with these stored values. The values will remain active until the **UNDER** or **OVER** keys are pressed again.

OU.SEt

OU.SET Operating Mode

In OVER/UNDER SET mode, the operator sets the limits of the ACCEPT band by keying in weight values with front panel keys.

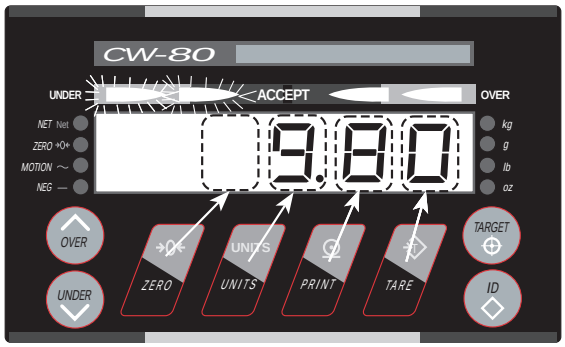


OU. SET Operation Instructions

To set Un 1 (the lower limit), press the **UNDER** key. Both Under arrowheads will flash to indicate you are in the Under Display/Set mode. The current Un 1 value will be displayed.

If you wish to change the value, you must first establish the direction of change. If you will be increasing the value, press the **OVER (up)** key once. If you will be decreasing the value, press the **UNDER (down)** key once.

Pressing the key that is beneath a digit will increment or decrement that digit, depending on the direction of change you established with the **OVER** or **UNDER** key in the previous step.



When the desired new value is displayed, press the **ID** or **TARGET** key (or wait 3 seconds without a keypress). The CW-80 will store the new value then shift back into normal weighing mode.

To set Ov 1 (the upper limit), press the **OVER** key. Both Over arrowheads will flash to indicate you are in the Over Display/Set mode.

If you wish to change the value, follow the same steps as for changing the lower limit, then store the value with the **ID** or **TARGET** key..

Any weights that fall between those limits are in tolerance and will light the ACCEPT display.

Any number of weighments can be made with these stored values. The values will remain active until the operator changes the lower or upper limit.

To prevent the operator from changing values you have stored with an ID register, you may disable the **OVER** and **UNDER** keys in Setup mode.

NOTE:

*A fast double press of the **UNDER** or **OVER** key will both establish the direction and put the CW-80 into an Auto Rolling sequence. The display rolls down or up, changing at an initial speed of 2 display divisions per second, then increasing to 10 display divisions per second. To stop the display rolling, press either the **OVER** or **UNDER** key.*

NOTE:

*In OU. SET mode, the **TARGET** or **ID** keys can be used to store the final Ov 1 and Un 1 values rather than waiting for the 3-second time-out period.*

CAUTION!

If the unit is placed in Setup mode before storing new Un 1 and OV 1 values in an ID register, the values will be lost upon returning to Normal Weighing mode.

Accessing Setup Mode:

Contact your installer or other qualified scale technician for information on accessing the CW-80 Setup mode.

PtE.SEt

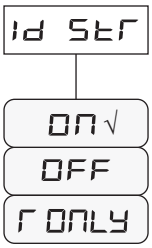
PTT.SET Operating Mode

PUSH TO TOLERANCE/SET mode combines both methods of setting lower and upper limits for the ACCEPT band. Each limit value is first set with a weight on the scale and stored by the appropriate **UNDER** or **OVER** keypress, as in the OU.PTT mode. A second press of the key puts the CW-80 into a Display/Set mode where the stored value can be digitally changed, as in the OU.SET mode. Final values are stored by pressing the **TARGET** or **ID** key, or automatically after a 3-second time-out with no activity.

NOTE:

*In PTT. SET mode, the **TARGET** or **ID** keys can be used to store the final Ov 1 and Un 1 values rather than waiting for the 3-second time-out period.*

4. Establishing ID Registers



Overview

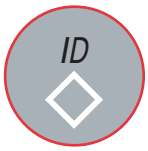
When the Setup menu under "ID STR" is set to ON, up to 299 separate ID registers can be established. Each ID number is normally associated with a product, and must have four categories of information stored with it:

- Unit of measure
- Lower limit of ACCEPT band
- Upper limit of ACCEPT band
- Tare value

The operator can access these product ID registers by pressing the **ID** key as shown on the separate *CW-80 Operator's Card*.

NOTE:

In addition to the primary unit, up to three alternate units (ALT 1, ALT 2, ALT 3) can be established in the Setup mode. Refer to p. 3-5 in the ***CW-80 Installation and Service Manual*** *for information on setting up alternate units.*



Setting Up an ID Register

Check that the desired units annunciator is lit. If a different unit is active, press the **UNITS** key until the correct unit is lit. See note at left.

Establish and store the desired tare.

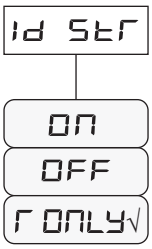
Establish and store the desired lower ACCEPT tolerance (Un 1).

Establish and store the desired upper ACCEPT tolerance (Ov 1).

Press **ID** key to display the current ID number. Use the keys beneath the digits to change the display to the ID number you want to associate with the units, tare, and tolerances that you have just established.

Immediately press the **ID** key a second time to store the completed ID register. "STORED" will briefly be displayed.

If the 3-second time-out occurs before you press the **ID** key a second time to store, the new values will not be stored with the displayed ID. Instead, previous values stored with that ID number will be recalled, and "RECALL" will be displayed. If this happens, begin the procedure again.



Protecting ID Registers from Accidental Overwrite

To prevent an operator overwriting ID registers you have set up, you can configure the CW-80 for an ID "read only" operation. The operator can access any ID register by pressing the **ID** key but can't change the values nor establish new registers.

Read-only operation must be established in Setup mode after you have established all ID registers. Contact your installer or other qualified scale technician for information on accessing the CW-80 Setup mode.

5. Setting Over and Under Arrowhead Displays

Overview

The various Under and Over arrowheads can be set up like a bar graph in a sequential lighting pattern to give the CW-80 operator an indication of how far the weight on the scale is under or over the ACCEPT range.

The bar graph values which trigger the arrowheads to light are established in either the Normal Weighing mode as weight units or in the Setup mode as graduations.

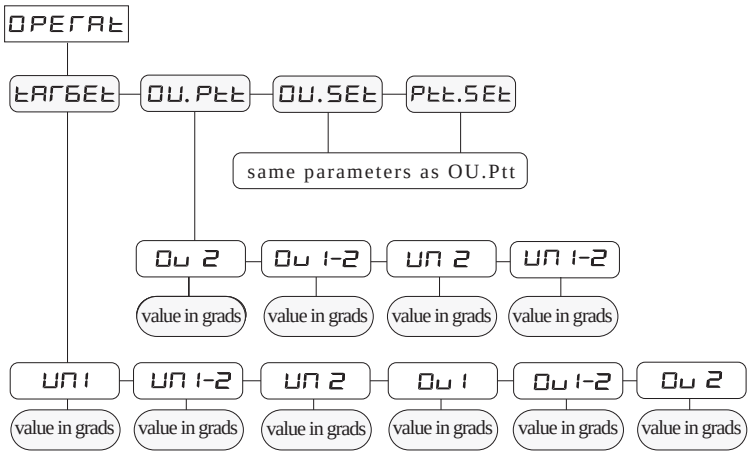
Primary Bar Graph Values — Un 1, Ov 1

The inner arrowheads closest to the ACCEPT display are called the Primary Arrowheads because their settings determine the ACCEPT band. As such, they must be set for any Under/Accept/Over checkweigh operation. These settings for the Primary Arrowheads are also important because they can be used to trigger digital outputs for OVER and UNDER conditions (if digital outputs are active).

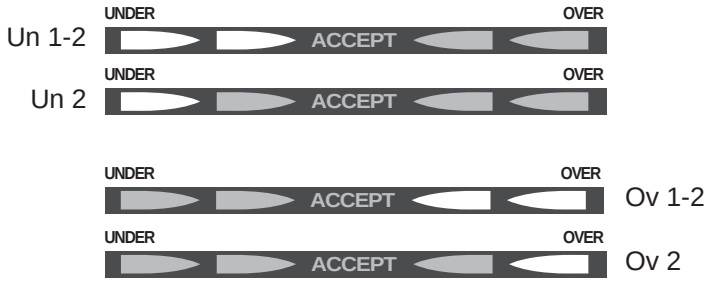
When the scale weight is just under or just over the ACCEPT range by 1 display division, the Under or Over arrowhead closest to the ACCEPT band comes on. Because these are the first Over and Under arrowheads to light when outside the ACCEPT band, they are called Un 1 and Ov 1. To allow easy setting of Un 1 and Ov 1 values without going into the Setup mode, these values can (in most cases) be set from the Normal Weighing mode using weight values. However, note in the OPERATE menu graphic below that the TARGET mode requires Un 1 and Ov 1 to be set in grads while in Setup mode.

Accessing Setup Mode:

Contact your installer or other qualified scale technician for information on accessing the CW-80 Setup mode.



Secondary Bar Graph Values — Un 1-2, Un 2, Ov 1-2, Ov 2



NOTE:

The factory-set defaults for all bar graph values which require grad settings in Setup mode is 3 grads.

Accessing Setup Mode:

Contact your installer or other qualified scale technician for information on accessing the CW-80 Setup mode.

The Secondary Arrowhead displays shown above are not necessary for simple Under/Accept/Over checkweigh operations, and most installers choose not to set them up, but merely use the factory-set defaults. In some applications, accurate displays are helpful to give a visual clue as the operator adds or removes weight to "zero in" on the acceptable weight.

These bar graph values are established in the Setup mode under the OPERATE submenu where the values are entered as grads. Entering these values in grads allows conversion to different units of measure during weighing operations without changing the relative size of the value.

Note that these bar graph values are cumulative as you move further from the ACCEPT band. See the following example.

> Assume you are using a 30 lb scale in TARGET mode with 3000 divisions and a .01 lb grad size.
>
> If you needed an ACCEPT tolerance of ±.1 lb, you would set Un 1 and Ov 1 to 11 grads (11 x .01 lb = .11 lb). With a 10.0 lb target, the primary arrowheads (Un 1, Ov 1) closest to ACCEPT would then come on at 9.89 lb and 10.11 lb.
>
> If you want the secondary arrowhead displays to come on with the same ±.1 lb change, you would set Un 1-2 and Ov 1-2 to 10 grads. The Un 1-2 and Ov 1-2 arrowhead display would then come on at 9.79 lb and 10.21 lb. You would set Un 2 and Ov 2 for 10 grads, so the Un 2 and Ov 2 arrowheads would come on at 9.69 lb and 10.31 lb.

Calculating Weight Tolerance Values in Graduations

To find a weight tolerance value in graduations, use the following formula:

Number of grads = tolerance value ÷ grad size

For example, a 30 lb capacity scale with 3000 divisions has a grad size of 0.01 lb/grad.

NOTE:

When setting Ov 1 and Un 1, remember to add 1 grad to the actual tolerance value. The entire tolerance value will then be ACCEPT, with the first arrowheads lighting 1 grad outside this band.

Assume a TARGET operating mode application with a ±1.0 lb tolerance. To find Un 1 and Ov 1 in grads:

# of Grads = (1.0 lb ÷ .01 lb/grad) +1
# of Grads = 100 +1 =101
therefore, use 101 grads for Un 1 and Ov 1

6. Setup Examples

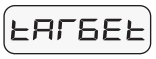
Product tolerance of ±.2 lb. for any target weight.

TARGET mode, 30 lb capacity scale, 3000 divisions, .01 lb/grad, with various weights used for target.

To find .2 lb expressed in graduations, divide .2 lb by .01 lb/grad.

.2 lb ÷ .01 lb/grad +1 = 21 grads.

Un 1 setting = 21 grads; Ov 1 setting = 21 grads.



Product tolerance of 15 lb, ±5%.

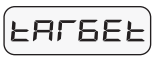
TARGET mode, 30 lb capacity scale, 3000 divisions, .01 lb/grad, with 15.00 lb test weight used for target.

5% of 15 lb = .75 lb.

To find .75 lb expressed in graduations, divide .75 lb by .01 lb/grad.

.75 lb ÷ .01 lb/grad +1 = 76 grads.

Un 1 setting = 76 grads; Ov 1 setting = 76 grads.



Product tolerance of 50 lb, -1%, +3%.

TARGET mode, 60 lb capacity, 3000 divisions, .02 lb/grad, with 50.00 lb test weight used for target.

1% of 50 lb = .5 lb.

To find .5 lb expressed in graduations, divide .5 lb by .02 lb/grad.

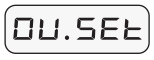
.5 lb ÷ .02 lb/grad +1 = 26 grads.

Un 1 setting = 26 grads.

3% of 50 lb = 1.5 lb.

1.5 lb ÷ .02 lb/grad +1 = 76 grads.

Ov 1 setting = 76 grads.



Acceptable Product weight between 8.000 lb and 8.040 lb , ACCEPT tolerances keyed in by operator, and secondary arrowheads lighting at .010 lb intervals.

SET mode, 10 lb capacity, 10,000 divisions, .001 lb/grad.

Un 1, Ov 1

From front panel (not in Setup mode), Under tolerance (Un 1) is keyed in at 7.999; Over tolerance (Ov 1) is keyed in at 8.041.

Un 1 setting = 7.999 lb, Ov 1 setting = 8.041 lb.

Un 1-2, Un 2

To find .01 lb expressed in graduations, divide .01 lb by .001 lb/grad.

.01 lb ÷ .001 lb/grad = 10 grads .

Un 1-2 setting = 10 grads, Un 2 setting = 10 grads.

Ov 1-2, Ov 2

.01 lb ÷ .001 lb/grad = 10 grads.

Ov 1-2 setting = 10 grads, Ov 2 setting = 10 grads.

Acceptable Product weight between 4.010 lb - 4.990 lb , ACCEPT tolerances set by operator using 4.000 lb and 5.000 lb test weights and secondary arrowheads lighting at .1 lb intervals.

PTT mode, 6 lb capacity scale, 3000 divisions, .002 lb/grad.

Un 1, Ov 1

Under tolerance (Un 1) set at 4.000 lb with test weight and PTT entry.

Over tolerance (Ov 1) set at 5.000 lb with test weight and PTT entry.

Un 1-2, Un 2

To find .1 lb expressed in graduations, divide .1 lb by .002 lb/grad.

.1 lb ÷ .002 lb/grad = 50 grads.

Un 1-2 setting = 50 grads, Un 2 setting = 50 grads.

Ov 1-2, Ov 2

.1 lb ÷ .002 lb/grad = 50 grads.

Ov 1-2 setting = 50 grads, Ov 2 setting = 50 grads.

7. Display Error Codes

DISPLAY	CONDITION	DESCRIPTION
nnnnnn	OVERLOAD	Weight on scale is greater than calibrated capacity range.
uuuuuu	UNDERLOAD	Displayed weight is less than calibrated capacity range.
Id ILL	ID ILLEGAL	ID number 0 cannot be stored. ID number must be a positive integer.
nO CAL	NO CALIBRATION	Configuration settings for capacity, divisions, grads, or decimal point have been changed. Recalibrate scale using current settings.
Id InU	NO TOLERANCE	No tolerances have been entered for the ID register.
bUFFEr	BUFFER FILLING	Buffer 90% full
FULL	BUFFER FULL	Buffer 100% full
FAIL S	FAIL SIGNAL	No load cell signal present.
dO Err	DATA OUTPUT ERROR	Cannot display lb/oz data in six display digits.
Err CL	CALIBRATION ERROR	CAL SP value must be greater than 20% of full scale.
Err LS	LOW SIGNAL ERROR	Less than 0.3 µV/grad signal is present.
bEn X	KEYPAD BUTTON FAILURE	Keypad button X is not producing a signal.
nO UnI	NO UNITS	EEPROM checksum failure. CW-80 has defaulted to original units.
Id Err	ID ERROR	EEPROM write failure. Unable to write to ID selected.

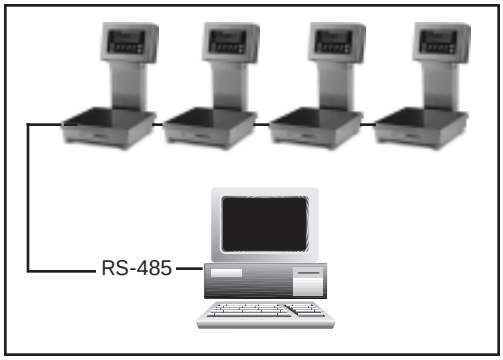
8. Remote Serial Commands

Overview

The EDP (Electronic Data Processing) port allows you to transfer important weigh-process data to printers or computers.

The CW-80 Checkweigher uses either bidirectional RS-232 or simplex (output only) 20 mA current loop communications as its standard communications interface. All characters are standard ASCII characters.

Optionally, an RS-485 communications package is available to provide networking capability of up to 32 devices (i.e., CW-80s, printers, and computers). Each can be individually addressed.



By using special commands from either a terminal keyboard or a specially-designed computer program, you can manipulate Over/Under/Tare and Units values, call up current settings for Tare/Tolerance sets, and perform reporting functions. Also, you can use special commands to transmit weight data directly from the CW-80's EDP port on demand.

When you send a command via the EDP port, the command must be in a specific format. Generally, you type the command on the remote keyboard and press **ENTER** or **RETURN** to send it in the formats shown.

This section describes four different command categories for implementing CW-80 EDP (serial) communications:

- Simple Commands (No Response)
- Inquiry Commands (Response)
- ID Reference Commands
- Read ID and Write to ID Commands

Each command category in this section includes a description of the related format.

Note:

Commands sent to CW-80 address 0 are broadcast commands. All CW-80s in the network interpret and act upon the particular command. No REPLY acknowledge character string is to be transmitted to indicate receipt of a command, since serial port bus contention will likely occur.

Simple Commands (No Response)

Simple Commands instruct the CW-80 to perform various functions. When you enter this type of serial command, the CW-80 acknowledges the command with "*[CR]".

SIMPLE COMMANDS (NO RESPONSE—ACKNOWLEDGE ONLY)

"Z"	(ZERO COMMAND)
"B"	(BUFFER ENABLE COMMAND)
"U"	(BUFFER DISABLE COMMAND)
"D"	(DATA BUFFER XMIT / DO NOT CLEAR)
"Y"	(DATA BUFFER XMIT / CLEAR)
"H"	(CLEAR BUFFER COMMAND)
"CT"	(CLEAR TARE COMMAND)
"CTG"	(CLEAR TARGET COMMAND)
"CO"	(CLEAR OVER COMMAND)
"CU"	(CLEAR UNDER COMMAND)

Command Format:

[SOH][ADDR HIGH][ADDR LOW] [COMMAND][CR]

[SOH]	ASCII character (01 Hex) "Start of Header" that is a preamble to all bidirectional serial commands.
[ADDR HIGH]	ASCII character for the most significant digit of the two-digit CW-80 address.
[ADDR LOW]	ASCII character for the least significant digit of the two-digit CW-80 address.
[COMMAND]	Simple Command of one or more characters that instructs the CW-80 to perform a function. The list of available commands is detailed above.
[CR]	ASCII character (1D Hex) "Carriage Return" used to end of a serial command.

Inquiry Commands (Requesting Status/Data)

Inquiry Commands instruct a selected CW-80 to transmit weight data or status values of parameters back to the host controller. When you enter this type of serial command, the selected CW-80 responds with data.

INQUIRY COMMANDS (REQUESTING STATUS)

"XS"	(XMIT STATUS COMMAND)
"RT"	(RECALL TARE COMMAND
"XTG"	(XMIT TARGET COMMAND)
"XO"	(XMIT OVER COMMAND)
"XU"	(XMIT UNDER COMMAND)
"XT"	(XMIT TARE COMMAND)
"X"	(XMIT DATA COMMAND)
"XW"	(XMIT WEIGHT DATA COMMAND)
"XC"	(XMIT CURRENT TOLERANCE STATUS)
"XTA"	(XMIT ALL TARES COMMAND)
"XTGA"	(XMIT ALL TARGETS COMMAND)
"XOA"	(XMIT ALL OVERS COMMAND)
"XUA"	(XMIT ALL UNDERS COMMAND)

Command Format:

[SOH][ADDR HIGH][ADDR LOW][COMMAND][CR]

[SOH]	ASCII character (01 Hex) "Start of Header" that is a preamble to all bidirectional serial commands.
[ADDR HIGH]	ASCII character for the most significant digit of the two-digit CW-80 address.
[ADDR LOW]	ASCII character for the least significant digit of the two-digit CW-80 address.
[COMMAND]	Simple Command of one or more characters that instructs the CW-80 to perform a function. The list of available commands is detailed above.
[CR]	ASCII character (1D Hex) "Carriage Return" used to end of a serial command.

Command Format Key:

[ ] represents a separate field of information.
" " represents literals which will appear as shown.

ID Reference Commands

ID Reference Commands instruct the CW-80 to transmit various values associated with a particular ID number.

ID REFERENCE COMMANDS

"RT"	(RECALL TARE REGISTER COMMAND)
"XT"	(XMIT TARE COMMAND)
"XTG"	(XMIT TARGET COMMAND)
"XO"	(XMIT OVER COMMAND)
"XU"	(XMIT UNDER COMMAND)
"CT"	(CLEAR TARE COMMAND)
"CTG"	(CLEAR TARGET COMMAND)
"CO"	(CLEAR OVER COMMAND)
"CU"	(CLEAR UNDER COMMAND)

Command Format:

[SOH][ADDR HIGH][ADDR LOW][COMMAND][ID#][CR]

[SOH]	ASCII character (01 Hex) "Start of Header" that is a preamble to all bidirectional serial commands.
[ADDR HIGH]	ASCII character for the most significant digit of the two-digit CW-80 address.
[ADDR LOW]	ASCII character for the least significant digit of the two-digit CW-80 address.
[COMMAND]	Two-character sequence that instructs the CW-80 to perform a function. The list of commands is detailed above.
[ID#]	Three-character field of ID number.
[CR]	ASCII character (1D Hex) "Carriage Return" used to end a complete serial command.

Command Format Key:

[ ] represents a separate field of information.
" " represents literals which will appear as shown.

Commands to Write to ID Registers

The !I command is used to transmit an ID Register set to a CW-80, storing the contents in the desired ID# location.

USING THE !I COMMAND TO WRITE TO AN ID REGISTER SET:

Command Format:

[SOH][Addr]["!I"][ID#][","][Under Data][,][Over Data][,] [Tare Data[,][Unit] [CR]

[SOH]	ASCII character (01 Hex) "Start of Header".
[Addr]	Two-character ASCII sequence (00-99) for the CW-80 address.
["!I"]	Two-character sequence that instructs the checkweigher to store the associated Tare/ Tolerance data in the ID#.
[","]	ASCII Character 2C Hex.
[ID#]	Three-character field of the ID number.
[Under Data]	7-character field (including a decimal point) that represents the Under Value to be associated with this ID. The field must be in the same format as the displayed format for the Unit of measure associated with the ID record. All 7 characters must be sent and spaces are represented by leading zeros.
[Over Data]	7-character field (including a decimal point) that represents the Over Value to be associated with this ID. All 7 characters must be sent and spaces are represented by leading zeros.
[Tare Data]	This is a 7 character field including decimal point that represents the Tare Value to be associated with this ID. All 7 characters must be sent and spaces are represented by leading zeros.
[UNITS]	This is a single character field indicating the units of measure. L = pounds; K = kilograms; G = grams; O = ounces; Z = pounds and ounces.
[CR]	ASCII character (1D Hex) "Carriage Return" used to signify the end of a complete serial command..

Example:

To enter the the following Tare/Tolerance register (Tare value=1.3 kg, Over value= 20.05 kg, Under value of 20.00 kg) into ID#45 Checkweigher with Address 36, send the following:

[SOH]36!I045,0020.00,0020.05,0001.30,K[CR]

Commands to Read ID Registers

?I is used to command the CW-80 to send back an ID Register set to the host controller.

TO READ THE CONTENTS OF AN ID REGISTER SET:

Command Format:

[SOH][Addr]["?I"][ID#][CR]

[SOH]	ASCII character (01 Hex) "Start of Header".
[Addr]	Two-character ASCII sequence (00-99) for the CW-80 address.
["?I"]	Two-character sequence for the command instructing the checkweigher to send the associated Tare/Tolerance data out the serial port.
[ID#]	Three-character field that specifies the ID where the OVER/UNDER/TARE/UNITS data is stored.
[CR]	ASCII character (1D Hex) "Carriage Return" used to end a complete serial command.

Example:

To request the Tare/Tolerance values from the register set of ID#16 of a Checkweigher with an Address of 85, send the following:

[SOH]85?I016[CR]

If the CW-80 is commanded to send an inactive ID register with no data, it sends back the "Empty" response.

CW-80 "EMPTY" RESPONSE IF NO DATA IS PRESENT

Response Format:

[STX][ID#][:][sp]["empty"][EOL]

[STX]	ASCII character (02 Hex) "Start of Text".
[ID#]	Three-character ID
[":"]	ASCII Character 3A Hex.
[sp]	ASCII Character 20 Hex.
["empty"]	ASCII literal string, excluding the "" marks.
[EOL]	ASCII End of Line "CR" or "CR/LF" as determined at Setup.

If the CW-80 is commanded to send an active ID register which has data, it will send back data in the format below.

CW-80 RESPONSE FORMAT WITH DATA PRESENT

Response Format:

[STX][ID#][","][Under Data][","][Over Data][","] [Tare Data][","][Unit] [EOL]

[STX]	ASCII character (02 Hex) "Start of Text" that is a preamble to all bidirectional serial command responses
[ID#]	Three-character field that specifies the ID where the OVER/UNDER/TARE/UNITS data is stored.
[","]	ASCII Character 2C Hex.
[Under Data]	Eight-character field (including sign and decimal point) of the under tolerance. All eight characters are sent and spaces are substituted for leading zeros. A positive sign is transmitted as a space.
[Over Data]	This is an eight-character field (including sign and decimal point) for the over tolerance. All eight characters are sent and spaces are substituted for leading zeros. A positive sign is transmitted as a space.
[Tare Data]	This is an eight-character field including sign and decimal point that represents the Tare Value associated with this ID. The field is in the same format as the displayed format for the Unit of measure associated with the ID record. All eight-characters are sent and spaces are substituted for leading zeros. A positive sign is transmitted as a space.
[UNITS]	Single character indicating the units of measure. L = pounds; K = kilograms; G = grams; O = ounces; Z = pounds and ounces
[EOL]	ASCII End of Line "CR" or "CR/LF" as determined at Setup.

Command Format Key:

[ ] represents a separate field of information.

" " represents literals which will appear as shown.