PENNSYLVANIA

Pennsylvania Scale Co.
1042 New Holland Ave.
Lancaster PA 17601
800-233-0473
www.pascale.com

# INSTRUCTION & SERVICE MANUAL

## 7600E Digital Indicator


V2.84 Part# 12199

## TABLE OF CONTENTS

## SPECIFICATIONS

**Smart Serial Setup:** 8 custom print files plus 8 macro files, 30 characters each.

**Batch Start/Stop:** Control from front panel or remote input.

**Setpoint Operation:** 4 output relays configurable for normal setpoints, over/under or manual/auto batch modes.

## LOAD CELL A/D CONVERTER

TYPE: 24 bit delta sigma
EXCITATION: 5 VDC, 120 mA max.
SIGNAL INPUT: 16 mv
SENSITIVITY: 0.1 uV/grad
UPDATE RATE: 30 update/second

**DISPLAY:** Six (6) Decades, 0.6 inch LED

**KEYPAD:** Full numeric plus controls

**POWER INPUT**: 117/217 VAC, 50-60 HZ, 20 watts, fuse 0.25 A Slo-Blow.

**SERIAL PORTS:**
**Port 1**: RS232C or 20ma
**Port 2**: RS485, RS232C or 20mA.

**ENCLOSURE**: Stainless Steel, NEMA 4x, Tilt - Stand Base, 7lbs.

**CASE:** 9” (w) x 6.44” (h) x 4” (d) Tilt or panel mount.

**OPTIONS:**

**TIME & DATE:** 12/24 hr, battery backed.

**ANALOG OUTPUT:** 0-10v, 4-20ma (16 bit D/A).

**DIO:** 4 AC/DC – inputs, 4 AC outputs (SS Relays, 0.5 amp)

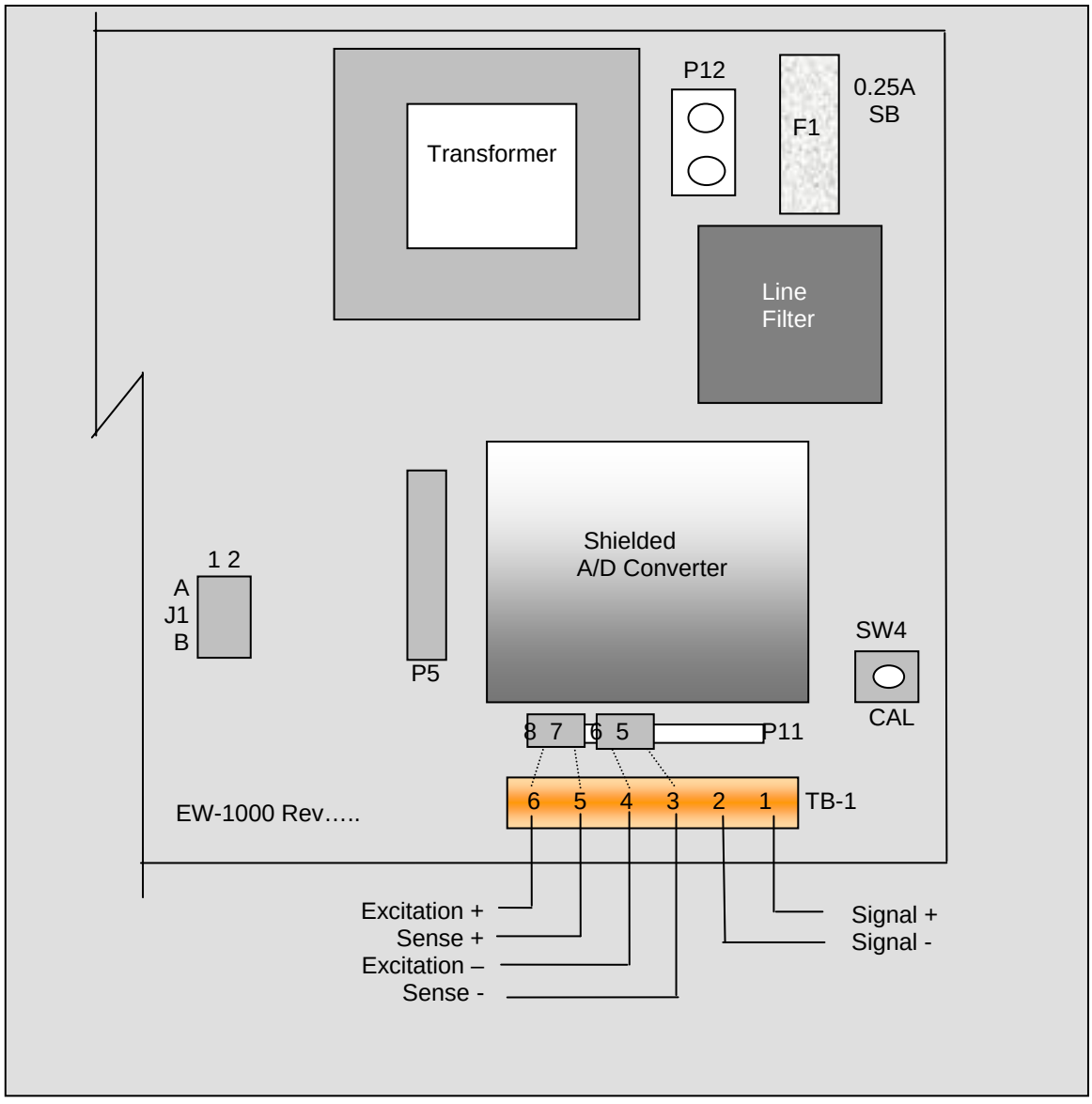
**Optional Case:** 10” (w) x 6.5” (h) x 4” (d) Tilt only.

**Panel Mount**: Kit (replaces tilt stand).

## INSTALLATION

**POWER WIRING**: The indicator is designed to be operated from 117/217 VAC, 50-60 Hz. The unit power cord must be plugged into a grounded 3 - wire polarized AC wall socket. All normal wiring and grounding precautions should be observed, including use of a "clean" AC power line.

**SCALE WIRING**:The unit is equipped with cable gland entry for load cell cable insertion and internal (pluggable) terminal strip for 4 / 6 wire connection. Remove sense jumpers P11-8/7, P11-6/5 for six wire.




**SETUP ACCESS**

To access instrument configuration, calibration or to enable options, depress the “Zero” key for five seconds.

The Audit Trail counters (“Pxxxx” and “Cxxxx”) are displayed first followed by access code request (“AC?”). The initial factory setting is “0000” which can be entered with four steps of the “Gross/Net” key (“AC0000”) and “Print”. If no entry is made, instrument returns to operate mode.

The access code can be changed to any four digit combination during setup exit when display again shows “AC?”.

The “Check” key provides the software version “V 1.XX” followed by the display test routine. Use the “ENT” key to advance to the keyboard test and to exit tests.

After entry, use the “Tare Recall” key to select a main menu; configuration (“SEL.CFG”), calibration (“SEL.CAL”), or options (“SEL.OPX”) and “Start/Stop” to back step.

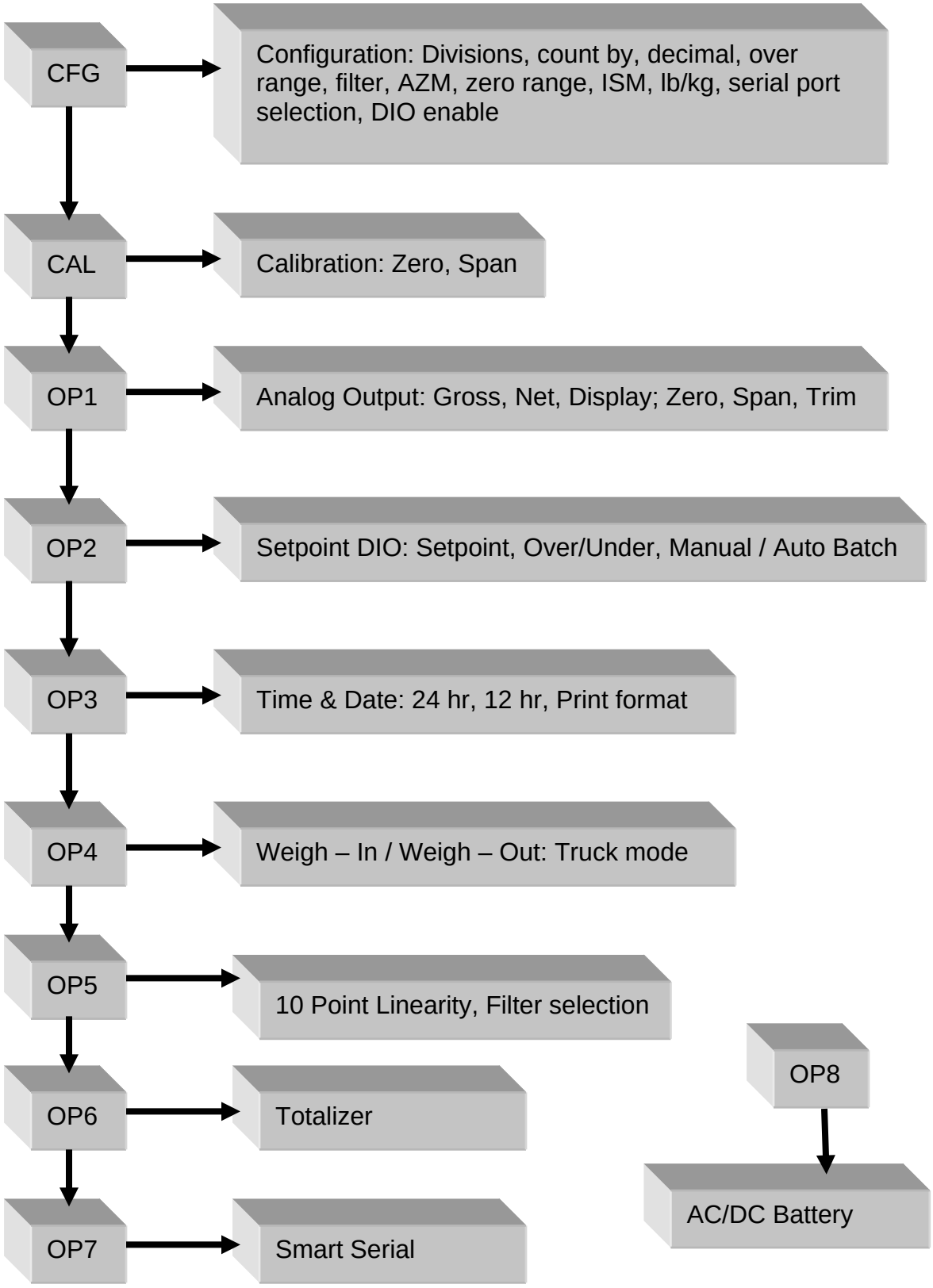
The “Gross/Net” key enters selected menu and is used to step through sub categories. Individual parameter selection is made with the “Tare/Recall” key, which then steps through the parameter choices (“Zero” key back steps within the menu).

The “ENT” key is used at any point to “back” up from categories to menus and to “save?” and “AC?” and exit.

During the exit steps, if changes were made, the display is “save?” with alternate “no”. To save changes, use the “Units” key to select “yes” and “ENT” to exit.
Calibration numeric entries are entered directly followed with the “ENT” key.

**Front panel access is inhibited if conventional “sealing” is applied by setting jumper J1-1 in the B position. The board mounted “CAL” button is then used for access.**

## Menu Layout


CFG
Configuration: Divisions, count by, decimal, over range, filter, AZM, zero range, ISM, lb/kg, serial port selection, DIO enable
CAL
Calibration: Zero, Span
OP1
Analog Output: Gross, Net, Display; Zero, Span, Trim
OP2
Setpoint DIO: Setpoint, Over/Under, Manual / Auto Batch
OP3
Time & Date: 24 hr, 12 hr, Print format
OP4
Weigh – In / Weigh – Out: Truck mode
OP5
10 Point Linearity, Filter selection
OP6
Totalizer
OP7
Smart Serial
OP8
AC/DC Battery

**CONFIGURATION: "SEL.CFG"** Use Gross/Net to enter the menu and step to each category, Tare Recall to select parameters. ENT to return to menu selection.

Capacity is the combination of "1", "2" and "3".
Example: 1__100, 2___2 and 3__0.0 = 2,000 x 0.2 lb

| Step | Parameters | Definition |
|---|---|---|
| **1** | **5, 10, 15, 20…100, 120…1000** | **Number of divisions x100**<br>100 = 10,000 divisions |
| **2** | **1, 2, 5, 10, 20, 50, and 100.** | **Count by selection**<br>10,000 divisions, count by 2 = 20,000 |
| **3** | **0, 0.0, 0.00, 0.000, and 0.0000** | **Decimal point selection** |
| **4** | **105P, 9 d (105% or 9 divisions)** | **Overrange selection** |
| **5** | **1, 2, 3, 4, 5, 6, 8, 10, 12, 15……90** | **Digital filter selection (averaging)** |
| **6** | **off, 0.5, 1, 3, 5, 10 (divisions)** | **Auto Zero Maintenance (AZM)** |
| **7** | **1.9, 5, 10, 20, FS (% of capacity)** | **Zero range selection**<br>1.9% of 2,000 x 0.2 = 38.0 lb |
| **7.1** | **off, on (ISM)** | **Zero's scale on power-up** |
| **8** | **off, 1, 3, 5,10 (divisions)** | **Motion Band selection** |
| **9** | **lb, kg, con** | **Units selection and convert** |
| **10** | **nt, Gtn, n.nt, n.Gtn.** | **Port 1 serial output selection**<br>nt display only, Gtn is Gross Tare Net and n.nt/n.Gtn inhibit negative gross printing |
| **11** | **off, co, de** | **Off, Continuous, or Demand** |
| **12** | **7o, 7E, 8n** | **7- odd, 7- even or 8- none** |
| **13** | **12, 24, 48, 96** | **Baud rate selection** |
| **14** | **off, 1, 2, 3, 5, 10, 15 (seconds)** | **Delay between lines or continuous output.** |
| **19** | **A, b** | **A : adds "STX" in continuous**<br>**b : No "STX" in continuous** |
| **20** | **nt, Gtn, n.nt, n.Gtn** | **Port 2 serial output selection** |
| **21** | **off, co, de, Ln** | **Off, Continuous, Demand, Network** |
| **22** | **7o, 7E, 8n** | **7- odd, 7- even or 8- none** |
| **23** | **12, 24, 48, 96** | **Baud rate selection** |
| **24** | **off, 1, 2, 3, 5, 10, 15 (seconds)** | **Delay between lines or continuous output.** |
| **25** | **1 – 16 (RS485/RS422)** | **Network address selection** |
| **30** | **off, on** | **DIO Inputs** |

**Remote Serial Display (RSD) Option**

In RSD mode the instrument can be set to work with another unit as a “remote” either as the main or the slave unit. Communication is pre-set for channel two only on both units. (RS232, 9600, 8, none)

When in remote mode, re-access to the following selections requires using the internal “cal” switch.

Remote unit can have full or partial control of the main unit. Devices are available to replace the cable for wireless communication.

| | | |
|---|---|---|
| **40** | **rd.OF,<br>rd.En,<br>rd.re** | **rd.En : Selects Indicator as Remote Display (RSD)<br>rd.re : Allows indicator to operate w/RSD** |
| **41** | **En.On** | **Allow remote keypad operation** |
| **42** | **Zr.On** | **Enable/Disable zero key** |
| **43** | **tr.On** | **Enable/Disable tare key** |
| **44** | **Un.On** | **Enable/Disable unit key** |
| **45** | | **Print function with parameter “11” see below** |
| **46** | **Fn.On** | **Enable/Disable all other functions** |

| **11.P1.xx** | **45.Pr.xx** | **RSD Serial Port 1** | **RSD Print Key** |
|---|---|---|---|
| **off** | **off** | **Disabled** | **Disabled** |
| **off** | **on** | **Disabled** | **Sends print cmd to weigh meter** |
| **co** | **off** | **Sends co serial** | **Disabled** |
| **co** | **on** | **Sends co serial** | **Sends print cmd to weigh meter** |
| **dE** | **off** | **Disabled** | **Disabled** |
| **dE** | **on** | **See right…..** | **Outputs demand format from RSD serial port 1** |

**CALIBRATION: "SEL.CAL"** Use Gross/Net to enter the menu indicated by a flashing "C" on the left and live weight is displayed. Scale zero (dead load) or adjusting span (single or multi-point) are independent. Therefore either can be done and repeated as necessary before exciting calibration. If an error has been made, exit without "storing" will return to prior setup.

| KEY (FUNCTION) | DISPLAY | Definition |
|---|---|---|
| (Live weight 123 lb) | "C"__123 | Cal mode scale reading |
| Zero (acquire dead load) | "------" to "C___0.0" | acquires new dead load |
| (live weight 5000 lb) | "C"__4995 | Scale reading with load |

**Enter numeric value directly:**

| | | |
|---|---|---|
| (Adjustment complete) | 005000 | adjusted value |

**Then ENT:**

| | | |
|---|---|---|
| (adjust span) | "------" to "C" 5000 | displays new span |

**Repeat as required then ENT to exit CAL**

"Save ?" "No" or "Save ?" "Yes" use Units to select and ENT to store "yes" with changes or "no" to exit without changes.

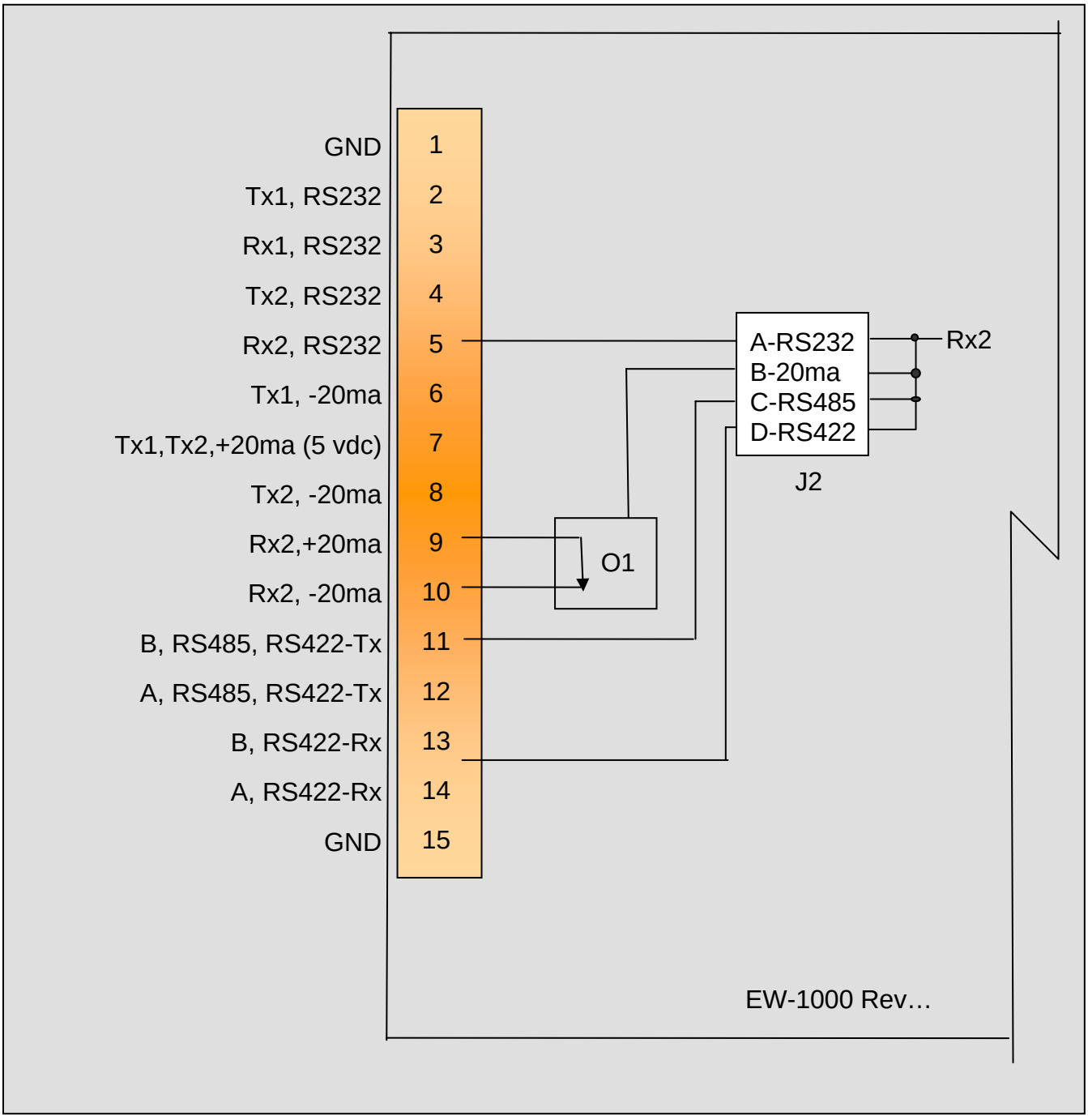
Continue with ENT to "Ent AC" which allows access code change by entering a new four digit code and ENT or ENT with no entry to maintain current password.

**Option 5** Ten point calibration: Allows up to 10 span points (pt1…….pt10). Zeroing the scale clears the existing values. Points are assigned incrementally with error indication if the addition is not above the prior point or exceeding scale capacity.
Filter selection included for rolling or box averaging.

| | | |
|---|---|---|
| **5.1** | **OFF, On** | **Enable 10 point span** |
| **5.2** | **A, b** | **A : Rolling average**<br>**B : Box average** |

**SERIAL PORTS**

Port 1: RS232 duplex (Rx,Tx), 20ma (Tx).
Port 2: RS232 duplex (Rx,Tx), 20ma (Rx,Tx), RS485, or RS422.
Note: Position jumper on J2 for Port 2 receive selection.



## Serial Communications

### Remote Commands

| | | |
|---|---|---|
| <Z><cr> | Zero Scale | “Gross” mode, no motion, inside zero range. |
| <N><cr> | Switch to Net | “Gross” mode with Tare stored. |
| <G><cr> | Switch to Gross | “Net” mode. |
| <T><cr> | Auto Tare | Switch to Net, no motion, not at “Gross” zero. |
| <P><cr> | Print | Valid display, No motion |
| <U><cr> | Units | Change units |

### Data Formats

Demand Mode: <stx><pol><DATA><sp><lb/kg><sp><GR/NT><cr/lf>

Continuous Mode: <stx><pol><DATA><L/K><G/N><status><cr/lf>

Brackets “<>” are not sent

stx: “Start of Text” character (ASCII 002) (can be removed in continuous: config 19)

pol: Polarity sign, “SPACE” (ASCII 032) for positive or (-) sign (ASCII 045) for negative

sp: Space character (ASCII 032)

DATA: Seven (7) digit data field including decimal point or fixed (dummy) zero if selected. “Leading Zero Suppression” with leading zeros transmitted as “space” characters.

lb/kg: Two (2) character field data identification for weight units, in demand (printer) mode.

Weight in lb = “lb” (ASCII 108,098), weight in kg = “kg” (ASCII 107,103)

L/K: One (1) character field data identification for weight units in continuous (computer) mode.

Weight in lb = “L” (ASCII 076), weight in kg = “K” (ASCII 075)

GR/NT: Two (2) character field data identification for weighing mode in demand (printer) mode.

Gross Mode = “GR” (ASCII 071,082), Net Mode = “NT” (ASCII 078,084)

G/N: One (1) character field data identification for weighing mode in continuous (computer) mode.

Gross Mode = “G” (ASCII 071), Net Mode = “N” (ASCII 078)

status: One (1) character data identification used in the continuous (computer) output mode to identify the status of the indicator. Characters are listed below in order of priority.

| | |
|---|---|
| Calibration/configuration | <D> (ASCII 068) |
| Over/Under Range | <O> (ASCII 079) |
| Motion | <M> (ASCII 077) |
| Center of Zero | <C> (ASCII 067) |
| None of the above | <sp>(ASCII 032) |

cr/lf: Two (2) character field, “Carriage Return” (ASCII 013), “Line Feed” (ASCII 010)

**Guidelines for Serial Output:**

Demand format will inhibit “print” when scale is in “motion” or with negative “Gross” weight, even in “Net” mode (based on setting “CFG 10”).

Local Network Protocol:

Command to the indicator:

<*><DD><00><cmd><data entry><CR>

Response from indicator:

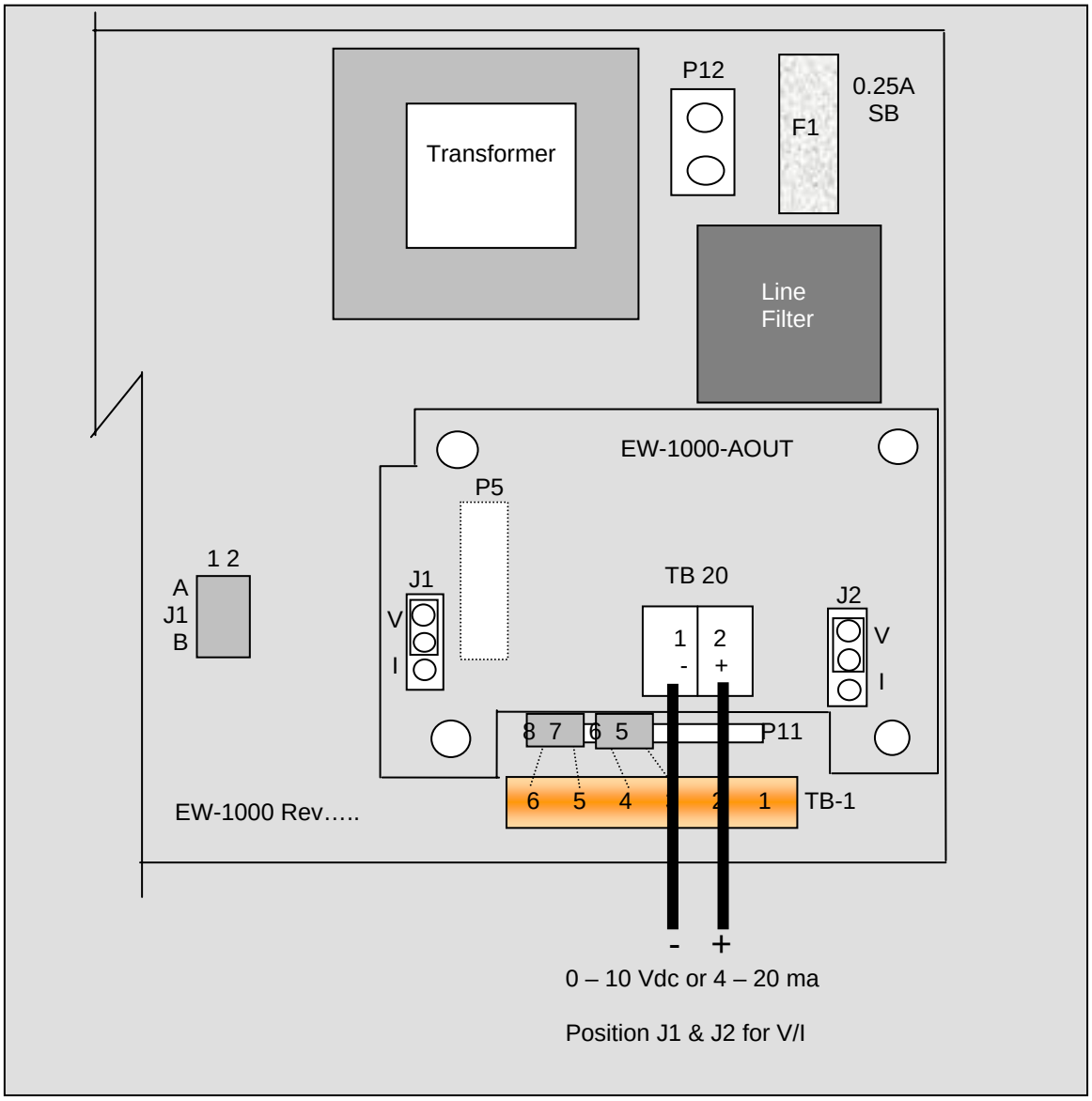
<:><00><DD><cmd echoed><data resp><CR>

Where: (<,> brackets not sent)

| | |
|---|---|
| * | = Message from master (2AH) |
| DD | = Indicators address |
| 00 | = Master address (fixed at 00) |
| CR | = Message terminator (ODH) |
| : | = Response from indicator (3AH) |
| cmd | = Command to indicator |
| cmd ech | = Command echoed from indicator |
| data ent | = Data entered into indicator |
| data resp | = Data response from indicator |

**OPTION 1: Analog Output**

0 – 10 Vdc or 4 – 20 ma, select with jumpers J1 and J2



**Option 1 Analog Output: "SEL.OP1"** Use Gross/Net to enter the menu and step to each category, Tare Recall to select parameters. ENT to return to menu selection.

| DISPLAY | Parameters | Definition |
|---|---|---|
| 1.1__Gr | Gr, Net, DSP | Analog tracks gross, net or display |

"1.5__Zr" "000" (flashes current analog starting point)

**Adjust value and ENT to adjust starting point.**

"1.6__FS" "500" (flashes current analog span point)

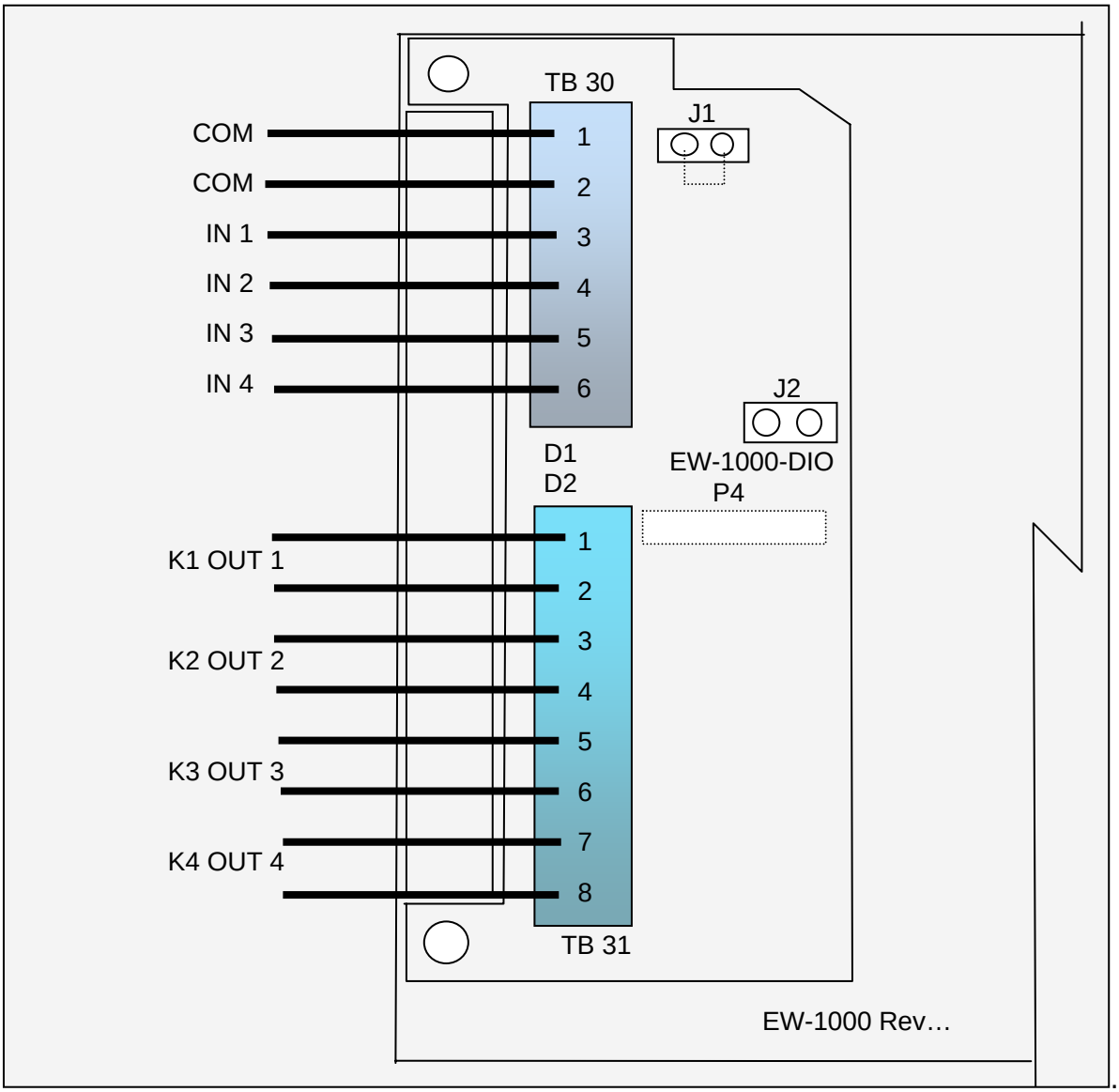
**Adjust value and ENT to adjust full scale.**

1.7__ZrA While monitoring the output, use Start/Stop to decrease, Tare Recall to increase the analog reading (Zero trim digi-pot).

1.8__FSA While monitoring the output, use Start/Stop to decrease, Tare Recall to increase the analog reading (Span Trim digi-pot).

**ENT to exit OP1.**

**OPTIONS 2: DIO**
AC Inputs; D1, D2 are not installed, J1 = short (underside), J2 = open, R1 – R4 = 18k (3w, 5%, flame proof).
DC Inputs; D1, D2 are installed, J1 = open (cut trace), J2 = short, R1 – R4 = 1.5k (1/2w, 5%, carbon film). AC Outputs; Solid State Relays, 120VAC, 0.5A.




**Option 2 DIO: "SEL.OP2"** First select the operating mode for "Setpoint", "Over/Under", "Manual or Auto Batch". After setup, the parameters for the selection are entered from

the weighing mode.
Use Gross/Net to enter the menu and step to each category, Tare Recall to select parameters. ENT to return to menu selection.

Note: external Inputs are enabled in Configuration with “CFG 30”.
DIO Inputs can be configured for 120vac, 5vdc or dry contact.

| | Normal | Batch | CFG 30 off Batch |
|---|---|---|---|
| IN 1 | Gross/Net | Stop | n/a |
| IN 2 | Tare | Start | n/a |
| IN 3 | Zero | Zero | Bypass Ing 1 |
| IN 4 | Print | Print | Bypass Ing 2 |

DIO Outputs are 120vac (0.5 amp) or optional 24 vdc, based on operating mode:

| | Dual | Setpt 1 | Setpt 2 | Ov/Un | Man B | Auto B |
|---|---|---|---|---|---|---|
| Out 1 | Setpt1-A | Main 1 | Main 1 | Low | Main 1 | Main 1 |
| Out 2 | Setpt1-B | Fast F1 | Fast F1 | Accept | Fast F1 | Fast F1 |
| Out 3 | Setpt2-A | Tol | Main 2 | High | Main 2 | Main 2 |
| Out 4 | Setpt2-B | Zero B | Fast F2 | Zero | Zero | Fast F2 |

Checkweigher “Bar” graph legends:

| | | | | | |
|---|---|---|---|---|---|
| Ck1-3 | Out Low | Low | Accept | High | Out High |

Setpoint values are entered from “Weighing Mode” by the SET key and direct numeric entry.
Weight errors of any kind (e.g., ol, ul, etc) will de-energize all relay outputs and abort a batch if one is in progress.
Four outputs are available to use as two setpoints with main and fast feed, single setpoint main and fast feed plus tolerance and zero band. Also Pre-Act can be applied to the main, for material in-flight compensation.

| **Step** | **Parameter** | **Definition** |
|---|---|---|

| | | |
|---|---|---|
| **2.0** | **OFF, SP, OU.UN, bAt1, bAt2** | Mode select: setpoint, over/under (check weighing), Manual Batch, Auto Batch |

| | | |
|---|---|---|
| **2.0** | **SP** | Setpoint |
| **2.2** | Off, s1, s1.p, s1.d, s.p.d, Dual | Setpoint. 1 + pre-act, + drib, + both, Set1-A&B. |
| **2.3** | Gr, nt, dSP, Count | Setpoint 1 tracks Gross, Net, Display, Count |
| **2.4** | POS, ZER | Output on below reading (POS), inverted (ZER) |
| **2.6** | Off, s2, s2.p, s2.d, s2.p.d, tOL, Dual | Setpoint. 2 + pre-act, + dribble, + both, Tolerance, Set2-A&B. |
| **2.7** | Gr, nt, dSP, Count | Setpoint. 2 + pre-act, + dribble, + both |
| **2.8** | POS, ZER | Output on below reading (POS), inverted (ZER) |
| **2.10** | ZbO | Zero band output (input weight value) |
| **2.11** | Off, On | Hysteresis, provides 3 grads to prevent relay chatter |
| **s.p.d** example | SP1.trG (Target) = 1000<br>SP1.PrE (Pre-act) = 5<br>SP1.drb (Dribble) = 10 | Main and Fast Feed are on until reading reaches 990, then Fast Feed turns off and Main continues until Pre-act at 995 |

| | | |
|---|---|---|
| **2.0** | **OU.UN** | Over/Under – check weighing |
| **2.2** | Off, HL, tGt, Ck1, Ck2, Ck3 | High/Low band, Target and +/- band, Check Weigher 1-3. |
| **2.3** | Gr, net, dSP | Outputs track Gross, Net, Display |
| **2.4** | POS, ZER | Invert low |
| **2.5** | POS, ZER | Invert accept |
| **2.6** | POS, ZER | Invert high |
| **2.10** | ZbO | Zero band output (input weight value) |
| **2.11** | Off, On | Hysteresis, provides 3 grads to prevent relay chatter |
| **2.12** | Off, On | Enables “Bar” graph legends |
| **HL** example | Low = 950<br>High = 1050 | Then low is on until 950, then accept is on until 1050 and high is on above 1050. |
| **tGt** example | Target = 1000<br>Low = 50<br>High = 50 | Outputs match above example for HL |

| | | |
|---|---|---|
| Note: | Batch printouts are from Port 1 only | |

| | | |
|---|---|---|
| **2.0** | **Bat 1** | Manual Batch mode, pauses between setpoints |
| **2.1** | Prn, tAr, dln | 7400 uses print, tare or external (DIO) for start. Pressing any key other than “start” will pause and a second push will abort. 7600E uses Start/Stop panel switch |
| **2.2** | Off, s1, s1.p, s1.d, s.p.d | Setpoint. 1 + pre-act, + dribble, + both |
| **2.3** | Gr, nt, dSP, Count | Setpoint 1 tracks Gross, Net, Display, Count |
| **2.4** | POS, ZER | Output on below reading (POS), inverted (ZER) |
| **2.6** | Off, s2, s2.p, s2.d, s2.p.d | Setpoint. 2 + pre-act, + dribble, + both |
| **2.7** | Gr, nt, dSP, Count | Setpoint. 2 + pre-act, + dribble, + both |
| **2.8** | POS, ZER | Output on below reading (POS), inverted (ZER) |
| **2.10** | ZbO | Zero band output (input weight value), available if S2 dribble not used |

| | | |
|---|---|---|
| **2.0** | **Bat 2** | Auto Batch mode, continues without pause |
| **2.1** | Prn, tAr, dln | 7400 uses print, tare or external (DIO) for start. Pressing any key other than “start” will pause and a second push will abort. 7600E uses Start/Stop panel switch |
| **2.2** | Off, s1, s1.p, s1.d, s.p.d | Setpoint. 1 + pre-act, + dribble, + both |
| **2.3** | Gr, nt, dSP, Count | Setpoint 1 tracks Gross, Net, Display, Count |
| **2.4** | POS, ZER | Output on below reading (POS), inverted (ZER) |
| **2.5** | Off, 1, 2, 3, …., 10 | Time Delay (settling) before print |
| **2.6** | Off, s2, s2.p, s2.d, s2.p.d | Setpoint. 2 + pre-act, + dribble, + both |
| **2.7** | Gr, nt, dSP, Count | Setpoint. 2 + pre-act, + dribble, + both |
| **2.8** | POS, ZER | Output on below reading (POS), inverted (ZER) |
| **2.9** | Off, 1, 2, 3, …., 10 | Time Delay (settling) before print |
| **2.10** | ZbO | Zero band output (input weight value), available if S2 dribble not used |

Relay override command: <RLY> K(1-4) State (0=off, 1=on)
<RLY><0> Reset, restore to normal operation.
<RLY><3><1> Turn K3 on
<RLY><4><0> turn K4 off

**Additional Serial Commands: Setpoint/Accumulator**

Totalizer/Accumulator reset command. Send TC<CR> to reset the totalizer, and the meter responds with a TC+<CR><LF> string.

**Ten/Nine-digit Accumulator Printing/Serial Format Output**

| COMMAND | Output | Description |
|---|---|---|
| TR1<CR> | “ 57.85 lb” | 10/9-digit w/ printable units (e.g., lb or kg) |
| TR2<CR> | “ 57.85LA” | 10/9-digit w/ computer units (e.g., L or K) & A for accumulator. |
| TR3<CR> | “ 57.85” | 10/9-digit only |
| TR4<CR> | “0000057.85” | 10/9-digit w/ leading zeros |

All transmissions are terminated by a CR &LF.
If there is a decimal-point in the accumulator, nine digits are transmitted.

**Setpoint Recall:**
<S><R><1><CR> Requests value of setpoint 1
<S><R<I><CR><LF> Response if Setpoint 1 is off
<S><R><1><(><SP><SP><1><0><0><0><)><CR><LF> if setpoint = 1000

**Setpoint Entry:**
<S><E><1><(><1><0><0><0><)><CR>

**Full-Duplex Setpoint Parameter Entry/Recall**

| | **1** | **2** | **3** | **4** | **5** | **6** |
|---|---|---|---|---|---|---|
| Setpoint | SP-1 | | | SP-2 | | |
| Setpt-Preact | SP-1 | Pr-1 | | | Pr-2 | |
| Setpt-Drib | SP-1 | | Dr-1 | | | Dr-2 |
| Stpt-pr-dr | SP-1 | Pr-1 | Dr-1 | | Pr-2 | Dr-2 |
| Stpt-dual | SP-1-A | | SP-1-B | SP-2-A | | SP-2-B |
| Output | K1 | | K2 | K3 | | K4 |

| **OP3** | **Time & Date** | |
|---|---|---|
| **3.1** | ---, 24H, 12A, 12P | Skip time, 24 hour, 12 hour am, 12 hour pm |

| | | |
|---|---|---|
| **3.2** | T1 | Set time: hh mm ss |
| **3.3** | dA | Set date: mm dd yy |
| **3.4** | S.no, no, Let | Month print selection, short numerical (mm/dd/yy), number 01 thru 12, month spelled out |
| **3.5** | Off, Un, Ab, On | Print under, above or on the same line |

| | | |
|---|---|---|
| **OP4** | Weigh – In / Weigh - Out | See page 19 |
| | | |
| **OP5** | 10 Point Linearity | On, Off see page 9 |
| | | |
| **OP6** | Totalizer | |
| **6.1** | Off, On, AU | Enable Totalizer (operates with Batch or Print)<br>AU: Auto accumulates/prints stable weight |
| **6.2** | Off, 1……50 | Totalizer reset band |

**Option 6** Totalizer: Operates with “print” function in normal mode or batch mode.

In normal mode, current value is added to the totalizer with each “Print” command. The reset band is used to inhibit a double add when not in Batch Mode.

View the Total with the “2” key and during the display (AC..XXXX), the “Print” key is used to print the total, the “Ent” key returns to weigh mode.

The “Clear” key is used to clear the totalizer by first changing the message from “Clr.ACC…no” to “Clr.ACC…yes” with the “Units” key and “Ent” to complete. A “Cleared” message is provided for conformation.

Note: Totalizer works with port 1 only and the “Print” key is disabled when Batch Mode and Totalizer are both enabled.

**OPTION 4: Weigh – In / Weigh – Out**

Truck Scale Application: Provides six digit Identification.

Operates in “Gross” only.

This mode provides a system for single scale applications to determine net weight by storing incoming weight and completing the transaction with out going weight.


| | | |
|---|---|---|
| **4.1** | Off, On | Turn on Weigh–in / Weigh-out |
| **4.4** | 1, 2 | Select print port 1 or 2 |
| **4.5** | 8n1, 7e1, 7o1 | Data setup, 8 bit no parity one stop, 7 bit even one stop, 7 bit odd one stop |
| **4.6** | 1200…..9600 | BAUD rate selection |
| **4.7** | Off, 1, 2, 3 | Line feed delay |

Note: Print format based on smart serial setup or unlabeled default. Truck ID cannot be accessed unless there are (min) five grads of weight on the scale.

**Full Truck IN**
Truck enters scale full, scale indicates “Stable”.

Operator inserts ticket and pushes “Print” key.
Display responds with “Id no” prompt.
Operator enters truck “ID Number”, up to 6 – digits.
Operator pushes “Ent” key.

Printer prints: Time/Date (optional)
(xxxxxx) ID. NO.
(xxxxxx) lb GR

Truck goes to empty load.
Empty truck returns to scale, scale indicates “Stable”.
Operator pushes “Print” key and “Id no” prompt appears.
Operator enters same ID Number as previously printed.
Operator pushes “Ent” key.

Printer prints: Time/Date (optional)
(xxxxxx) ID. NO.
(xxxxxx) lb GR Recalled
(xxxxxx) lb TR
(xxxxxx) lb NT

**Empty Truck IN**

Truck enters scale empty, scale indicates “Stable”.
Operator inserts ticket and pushes “Print” key.
Display responds with “Id no” prompt.
Operator enters truck “ID Number”, up to 6 – digits.
Operator pushes “Ent” key.

Printer prints: Time/Date (optional)
(xxxxxx) ID. NO.
(xxxxxx) lb GR

Truck goes to fill load.
Full truck returns to scale, scale indicates “Stable”.
Operator pushes “Print” key and “Id no” prompt appears.
Operator enters same ID Number as previously printed.
Operator pushes “Ent” key.

Printer prints: Time/Date (optional)
(xxxxxx) ID. NO.
(xxxxxx) lb GR
(xxxxxx) lb TR Recalled
(xxxxxx) lb NT

**Transaction Buffer: Select / Print / Clear / Clear All**

Select ID: With “ID” displayed, user can select a stored ID by pressing “Set” (up) or “Start/Stop” (down) to scroll through the buffer.

Print Buffer: Pushing Gross/Net with ID displayed will cause output of the complete buffer ( ID with Tare).

Clear ID: Pushing clear with ID displayed will clear that ID and step to the next.

Clear ALL: With “ID”, holding the clear switch will prompt “Rec.Clr” and using unit to switch to “yes” and enter will clear entire buffer.

**Option 7: SMART SERIAL I/O**

The SMART SERIAL I/O option now offers a wide degree of flexibility for an operator to customize the serial output format for individual system requirements. The custom print currently supports:

Specifying starting and terminating characters (**stx**, **cr**, **lf**, etc.).
Adding printer control characters.
Custom **headers**, **titles**, etc..
Customized parameters such as "**GROSS WEIGHT**" instead of "**GR**".
Custom insertion of special parameters such as **time/date** and **identification no**.
Truck mode custom printing.
Custom continuous serial protocol.
Custom '**P**' print out in duplex mode.

**FEATURES:**

***** Eight (8) custom print files automatically assigned.

***** Eight (8) macro files for easy setup of headers, titles, etc. .

***** Capability to upload and download the custom print files to a host computer.

***** Maximum file length is 30 characters and/or parameters. Maximum number of characters in an output string is (250).

***Note!****Custom print does* ***not*** *support RS485 protocol*

**STANDARD SERIAL CONFIGURATION:**
The SMART SERIAL I/O Option allows standard serial output ports to be modified and

imported into the serial output data stream.

**CUSTOM PROTOCOL FILE SELECTION:**
The selection of the associated custom print file is performed automatically by serial port and the data mode (GROSS, NET, TOTAL RECALL, or SPECIAL) that the instrument is currently in at the time of a print. In other words, if Ports 1 & 2 were selected for demand print (dE) and the instrument was in the "GROSS" mode at the time of a print request of the data, the serial output for Port 1 would use the contents of file 1 (7.1) and the contents of file 5 (7.5) for Port 2.
The selections under Option 7 may be divided into three main functional groups; the first 8 files (7.1 to 7.8), each of which can store up to 30 ASCII and/or parameter codes, are files pertaining to the actual customization of serial output data and are themselves further subdivided into Port 1 files (7.1 to 7.4) and Port 2 files (7.5 to 7.8), the second functional group pertains to the 8 MACRO files (7.9 to 7.16) that may be enterd into the primary files (7.1 to 7.8) by thier associated parameter codes 600 to 607 (7.9 = pararmeter code 600 etc.), each of these files can also store up to 30 ASCII and/or parameter codes.

| | | CUSTOMIZING | | | |
|---|---|---|---|---|---|
| | FILE | NORMAL MODE | TRUCK MODE | MACROS (8) | MACRO Parameter codes |
| PORT 1 | 7.1 | Gross data | Truck Mode Output Port is selected under option 4, Port 1 selection mirrors Port 2 below. | 7.9 | 600 |
| | 7.2 | Net data | | 7.10 | 601 |
| | 7.3 | Total data | | 7.11 | 602 |
| | 7.4 | Special (for future use) | | 7.12 | 603 |
| PORT 2 | 7.5 | Gross data | Truck Entry | 7.13 | 604 |
| | 7.6 | Net data | Truck Out Empty | 7.14 | 605 |
| | 7.7 | Total data | Truck Out Full | 7.15 | 606 |
| | 7.8 | Special (for future use) | Truck Fixed Tare | 7.16 | 607 |

**Notes:**

If Option 7 is enabled ("**on**") but a designated file is set to **off** then that print mode will print

its default format (eg. file 7.1 **off** - the GROSS data from Port 1 is sent out in its default format).

**MACRO FILES (7.9 TO 7.16):**

There are eight (8) macro files that can be accessed in any of the prime Print Files 1 - 8 (7.1 to 7.8) using the "600" series codes. Each macro file holds up to 30 ASCII characters and/or parameter codes.

***example:*** A header stating the company's name **Scrap inc.** is desired when Port 1 outputs GROSS mode weight data.

Printout = Scrap inc.
30000 LB GR 05/13/2005 12:30am

PRINT FILE 1 (7.1 - Port 1 "GROSS" mode data)

| LINE # | CODE | CODE definition |
|---|---|---|
| 01 | 002 | STX (start of text) |
| 02 | 600 | * macro file #1 (7.9) |
| 03 | 200 | gross wt. with "LB/KG GR" |
| 04 | 032 | SP (space) |
| 05 | 601 | *macro file #2 (7.10) |
| 06 | 013 | CR (carriage return) |
| 07 | 010 | LF (line feed) |
| 08 | 999 | END OF FILE |

CODE 600 (MACRO FILE 7.9)

| LINE # | CODE | CODE definition |
|---|---|---|
| 01 | 083 | S character |
| 02 | 099 | c character |
| 03 | 114 | r character |
| 04 | 097 | a character |
| 05 | 112 | p character |
| 06 | 032 | SP (space) |
| 07 | 105 | i character |
| 08 | 110 | n character |
| 09 | 099 | c character |
| 10 | 046 | . (period) |
| 11 | 013 | CR (carriage return) |
| 12 | 010 | LF (line feed) |
| 13 | 999 | END OF FILE |

CODE 601 (MACRO FILE 7.10)

| LINE # | CODE | Defininition |
|---|---|---|
| 01 | 402 | Date |
| 02 | 032 | SP |
| 03 | 401 | Time |
| 04 | 999 | END |

**CREATING AND EDITING FILES:** OPTION 7 CONFIGURATION

| | | |
|---|---|---|
| **7.0** | Off, On | Enables smart serial |
| **7.X** | Off, On | Enables each print buffer 7.1…..7.16 |
| | | |
| | Key | Description |
| **7.1** | SET | Access buffer 7.1 and exit when done |
| | 0-9 | Use numeric keys to enter code 0-999 |
| | ENT | Enter code |
| | CLEAR | Clear the code |
| | START/STOP | Insert code |
| | TARE RECALL | Clear entire (current) buffer |
| | GROSS/NET | Steps to next buffer position |
| | TARE | Go to first buffer position |
| | ZERO | Go to last buffer position |
| | | |

**IMPORTANT!** All files **must** be terminated with code 999

**CUSTOM PRINT FILES REMOTE READ AND WRITE**

**SSC** (Smart Serial Codes) command is provided to read or write buffer data 7.1…7.16.

Example:

Read

SSC<CR>

SSC 1 2 600 200 32 601 13 10 999
SSC 9 83 99 114 97 112 32 105 110 99 46 13 10 999
SSC 10 402 32 401 999

Write

SSC<sp><X><yyy><yyy><cr> Where X = buffer 1…16 (7.1…7.16), yyy = code

With a txt editor (such as Windows Notepad) and the serial loader program, buffers can be created and edited.

Text strings can also be entered directly surrounded by quotes:

SSC 9 “Scrap inc.” 702 999

Note: the 702 command CR/LF (13 10).

## ASCII CONTROL CODE CHART 1

| CONTROL | CONTROL | SYMBOLS | NUMBERS |
|---|---|---|---|

| CHAR | CODE | CHAR | CODE | CHAR | CODE | CHAR | CODE |
|---|---|---|---|---|---|---|---|
| **NUL** | 000 | **DLE** | 016 | **SP** | 032 | **0** | 048 |
| **SOH** | 001 | **DC1** | 017 | **!** | 033 | **1** | 049 |
| **STX** | 002 | **DC2** | 018 | **"** | 034 | **2** | 050 |
| **ETX** | 003 | **DC3** | 019 | # | 035 | **3** | 051 |
| **EOT** | 004 | **DC4** | 020 | **$** | 036 | **4** | 052 |
| **ENQ** | 005 | **NAK** | 021 | **%** | 037 | **5** | 053 |
| **ACK** | 006 | **SYN** | 022 | **&** | 038 | **6** | 054 |
| **BEL** | 007 | **ETB** | 023 | **'** | 039 | **7** | 055 |
| **BS** | 008 | **CAN** | 024 | **(** | 040 | **8** | 056 |
| **HT** | 009 | **EM** | 025 | **)** | 041 | **9** | 057 |
| **LF** | 010 | **SUB** | 026 | ***** | 042 | **:** | 058 |
| **VT** | 011 | **ESC** | 027 | **+** | 043 | **;** | 059 |
| **FF** | 012 | **FS** | 028 | **,** | 044 | **<** | 060 |
| **CR** | 013 | **GS** | 029 | **-** | 045 | **=** | 061 |
| **SO** | 014 | **RS** | 030 | **.** | 046 | **>** | 062 |
| **SI** | 015 | **US** | 031 | **/** | 047 | **?** | 063 |

## ASCII CONTROL CODE CHART 2

| | | | |
|---|---|---|---|

| UPPER CASE | | UPPER CASE | | LOWER CASE | | LOWER CASE | |
|---|---|---|---|---|---|---|---|
| CHAR | CODE | CHAR | CODE | CHAR | CODE | CHAR | CODE |
| @ | 064 | P | 080 | ` | 096 | p | 112 |
| A | 065 | Q | 081 | a | 097 | q | 113 |
| B | 066 | R | 082 | b | 098 | r | 114 |
| C | 067 | S | 083 | c | 099 | s | 115 |
| D | 068 | T | 084 | d | 100 | t | 116 |
| E | 069 | U | 085 | e | 101 | u | 117 |
| F | 070 | V | 086 | f | 102 | v | 118 |
| G | 071 | W | 087 | g | 103 | w | 119 |
| H | 072 | X | 088 | h | 104 | x | 120 |
| I | 073 | Y | 089 | i | 105 | y | 121 |
| J | 074 | Z | 090 | j | 106 | z | 122 |
| K | 075 | [ | 091 | k | 107 | { | 123 |
| L | 076 | \ | 092 | l | 108 | \| | 124 |
| M | 077 | ] | 093 | m | 109 | } | 125 |
| N | 078 | ^ | 094 | n | 110 | ~ | 126 |
| O | 079 | _ | 095 | o | 111 | | |

## PARAMETER CONTROL CODE CHART

| | | | |
|---|---|---|---|

| CODE | DESCRIPTION | CODE | DESCRIPTION |
|---|---|---|---|
| 200 | GROSS WT & 'LB/KG GR' | 240 | TRUCK GR0SS 'LB/KG GR' |
| 201 | GROSS WT & 'LG/KG' | 241 | TRUCK GROSS ONLY |
| 202 | GROSS WT | 242 | TRUCK TARE 'LB/KG TR' |
| 203 | GROSS WT(no 0 blanking) | 243 | TRUCK TARE ONLY |
| | | 244 | TRUCK NET 'LB/KG NT' |
| 210 | NET WT & 'LB/KG NT' | 245 | TRUCK NET ONLY |
| 211 | NET WT & 'LN/KN' | | |
| 212 | NET WT | 300 | STATUS CHARACTER |
| 213 | NET WT (no 0 blanking) | 400 | TIME & DATE PER SETUP |
| | | 401 | TIME PER SETUP |
| 220 | TARE WT & 'LB/KG TR' | 402 | DATE PER SETUP |
| 221 | TARE WT & 'LT/KT' | 500 | IDENT NO. & 'ID. NO.' |
| 222 | TARE WT | 501 | IDENT NO. ONLY |
| 223 | TARE WT(no 0 blanking) | | |
| | | | |
| 230 | TOTAL WT & lb/kg | | |
| 231 | TOTAL WT & LA/KA | 510 | TICKET NO & COUNT |
| 232 | TOTAL WT ONLY | 511 | COUNT ONLY |
| 233 | TATAL WT (no “0” blanking) | 702 | CR/LF |

## CUSTOM SERIAL ENTRY WORKSHEET

| LINE | CODE | DESCRIPTION | LINE | CODE | DESCRIPTION |
|---|---|---|---|---|---|
| 1 | | | 16 | | |
| 2 | | | 17 | | |
| 3 | | | 18 | | |
| 4 | | | 19 | | |
| 5 | | | 20 | | |
| 6 | | | 21 | | |
| 7 | | | 22 | | |
| 8 | | | 23 | | |
| 9 | | | 24 | | |
| 10 | | | 25 | | |
| 11 | | | 26 | | |
| 12 | | | 27 | | |
| 13 | | | 28 | | |
| 14 | | | 29 | | |
| 15 | | | 30 | | |

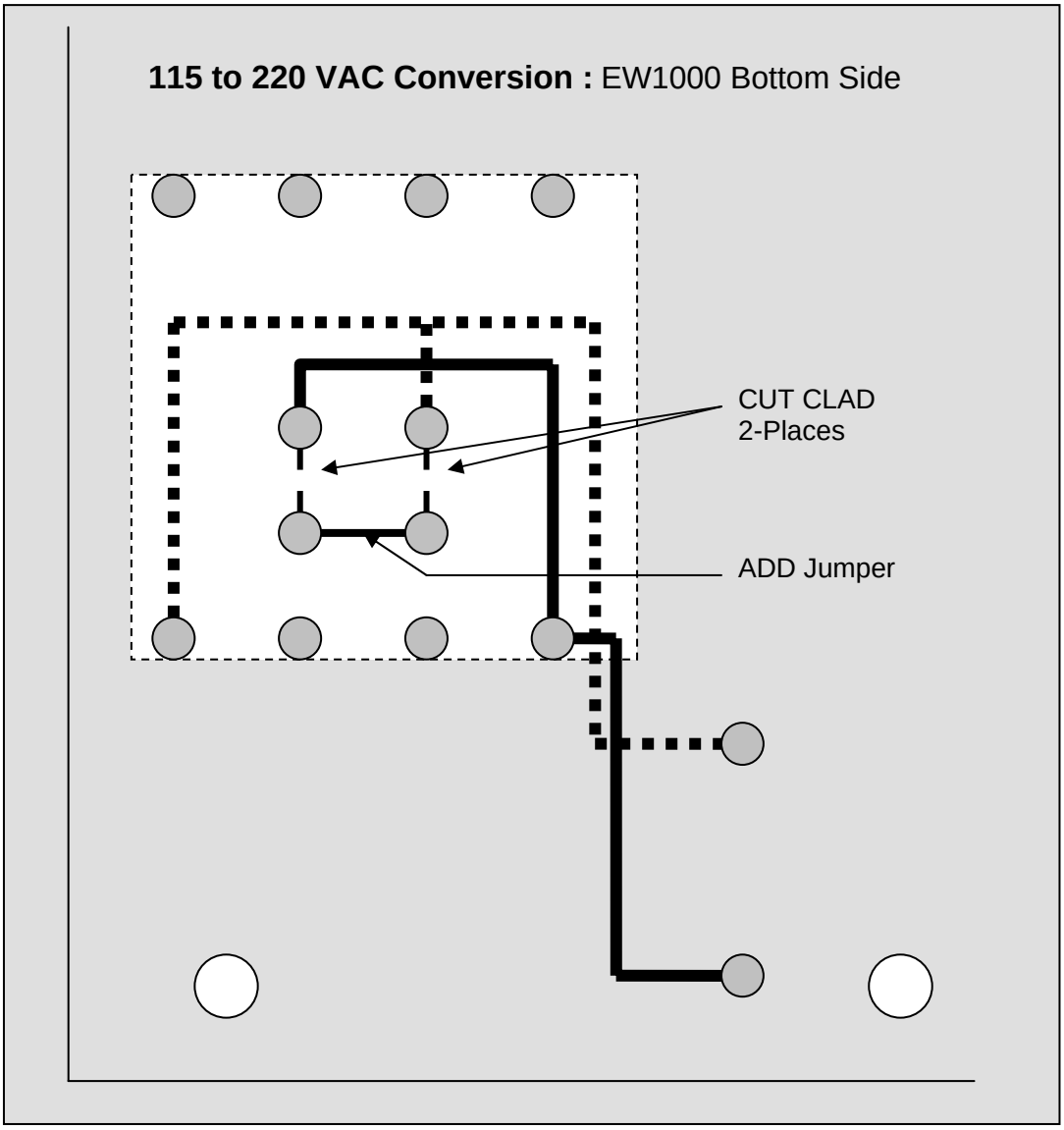
**Option 8: AC/DC operation**

| | | |
|---|---|---|
| **8.1** | Off, On | Enables battery charger |
| **8.2** | Off, 5, 15, 30, 90, 120 | Auto shutoff in minutes, timer resets with motion |

**DISPLAY MESSAGES**

| MESSAGE | DESCRIPTION |
|---|---|
| **DAC** | D/A card detected - Displayed under the check function. |
| **IIC.ERR** | IIC short - Power-up hardware failure indication. |
| **RST** | EEPROM is reset by EER command - Power-up message |
| **ON** | Displayed on power-up when the DC power push-button is pressed. |
| **AUTO** | EEPROM is reset - Power-up message |
| **ERR6.x** | Key-pad key is stuck. |
| **-232-** | Serial calibration/setup is active. |
| **UPDATE** | Enhancement calculation in progress. |
| **LO.BATT** | Low battery |
| **D BATT** | Dead battery |
| **ULULUL** | Under-load (-400 graduations under dead-zero) |
| **OLOLOL** | Over-load (+9 graduations or 105% from dead-zero reference) |
| **------** | A/D acquisition is in progress. |
| **7x00** | Instrument mode selection. |
| **Err 10** | Number > 999999 |
| **Err 13** | Number < -99999 |
| **ADC.Err** | A/D hardware failure (channel one only). |
| **CHECK** | Check mode accessed. |
| **rC.xxxx** | Lower four-digits of the ROM check-sum. |
| **Err.80** | Serial command data error. |
| **Err.81** | Unknown serial command. |
| **-CAL-** | Remote calibration |
| **Err.OFF** | Hardware failure of the D.C. power on/off circuitry. |
| **RTC.RST** | The clock is reset to 01:01:04 12:00:00am. |
| **RST ID** | The ID EEPROM has been reset since it was detected as corrupt. |
| **AC OK** | Access code entered has been accepted. |
| **E-1234** | EEPROM set 1,2,3, and/or 4 have been fixed. |
| **Err 40** | Positive or negative signal overload (check sense connections). |
| **Err 31** | Bad tare entry |
| **Err 30** | Push to Zero out of range |
| **PC Err** | Piece Weight Entry is out of range |
| | |

**115 to 220 VAC Conversion :** EW1000 Bottom Side



| Spare Parts | |
|---|---|
| | |
| Part No. | Description |
| 57819 | Main Board |
| 57512 | Display Board |
| 57860 | Keypad Overlay |
| 57675 | Display Cable |
| 56734 | Load Cell T-Strip Conn. |
| | U-Bkt |
| 56734 | U-Bkt Knobs |
| | Enclosure |
| 57811 | Analog Output |
| TBD | Setpoint AC input |
| TBD | Setpoint DC input |
| | Second Channel |