

EI-2000 DUAL CHANNEL WEIGHT & LEVEL DISPLAY/TRANSMITTER OPERATING MANUAL

FIRMWARE VERSION: $\geq$ 2.00
Rev.6/07/05



**EAGLE MICROSYSTEMS
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"ABOUT THE EI-2000"

The EI-2000 was designed by Eagle Microsystems Inc to provide a reliable, accurate and easy-to-use scale display at a reasonable cost. The standard NEMA-4X fiberglass enclosure provides excellent protection from the environment. Even troubleshooting has been made easy when using the onboard diagnostics. Trouble shooting can be accomplished right from the front panel. With the help of our customer support group most problems can be resolved quickly over the phone.

Calibration Verification is a unique feature that allows the user to verify system calibration every time for every cylinder. More importantly, it will correct errors associated with cylinder positioning. This can be done every time the operator installs a new cylinder. The effect can be significant for scales that are sensitive to load location. "Calibration Verification" feature can improve scale accuracy by a factor of four or more.

The EI-2000 has two easy to read displays. The .56" LED digits are readable from over 20 feet away. The large digits and LED annunciators tells the scale status at a glance. Because there are two displays both scales are always being displayed and no channel switching is required. Even scale calibration can be verified and recalibrated if necessary from the front panel, this is accomplished without opening the enclosure.

The fully automatic mode (Mode 3) greatly simplifies scale operation. The operator is only required to place a full cylinder on the scale and activate the [SELECT] button for that cylinder. The instrument automatically calculates the cylinder tare weight and then displays the amount of chlorine available.

The EI-2000 is more than just a weight indicator. Besides displaying weight of material remaining it also calculates and displays the amount of product used. Also, in the optional "Rate by Weight" mode it will calculate the rate that the product is being used and time remaining until empty.

For data logging or inventory control each scale has its own 4 - 20 mA analog output. The analog output can represent Gross Weight or Remaining Weight. When only a single receiver is available (i.e. single channel recorder) both scales can be summed and produce a 4 - 20 mA signal equivalent to the total of both scales. For full communications capability the RS485 serial I/O is available.

With the RS-485 option comes the ability to display the digital output of two USL-100 Ultrasonic Level Transmitters. The value can then be transmitted as a 4-20mA analog signal.

The EI-2000 has two optional relay outputs available for low level alarms or other type set points. For additional information refer to SPECIFICATIONS page 1.

TABLE of CONTENTS

SPECIFICATIONS.....	Pg. 1
OPERATING THE INDICATOR	Pg. 2-3
FRONT PANEL.....	Pg. 4
FRONT PANEL DESCRIPTION.....	Pg. 5
CALIBRATION.....	Pg. 6
DIP SWITCH S1	Pg. 7
USER CONFIGURATION.....	Pg. 7-9
ANALOG OUTPUT CONFIGURATION.....	Pg. 10
DIAGNOSTICS	Pg. 11
SPECIAL POWERUP FUNCTIONS.....	Pg. 12
MESSAGES.....	Pg. 12
CPU BOARD	Pg. 13
CONNECTOR WIRING	Pg. 14
INSTALLATION	Pg. 15

SPECIFICATIONS

LOAD CELL ANALOG INPUTS

CHANNELS	2
INTERNAL (A/D) RESOLUTION	21 BIT + SIGN
EXTERNAL (DISPLAY) RESOLUTION	100 - 5000 graduations
INTERNAL CONVERSIONS PER SECOND	60
DISPLAY UPDATES / SECOND	5 PER CHANNEL
MINIMUM SENSITIVITY	1 micro volt / grad
INPUT mV/V RANGE	-0.4 to +3.3
EXCITATION	10 +/- 0.5 volts
MAXIMUM EXCITATION CURRENT	120 mA
LOAD CELL CONNECTIONS	5 (+/- EXCITATION, +/- SIGNAL, & SHIELD)

ANALOG OUTPUTS

D/A RESOLUTION	12 bit
CURRENT OUTPUT RANGE	0 mA to 21 mA
VOLTAGE COMPLIANCE	8 VOLTS
DRIVE CAPACITY	0 to 400 ohms @ 20.0 mA
LINEARITY ERROR	< 0.1%, typical

RELAY OUTPUTS (OPTIONAL)

RELAY TYPE	SOLID-STATE
OPTIONS	AC OR DC, MUST SPECIFY
VOLTAGE MAXIMUM	250 V (AC), 400 V (DC)
CURRENT MAXIMUM	1.3A (AC), 1.3A (DC)
OPERATION	NORMALLY OPEN

POWER

A.C. LINE VOLTAGE OPTIONS	
(ALL SINGLE POLE)	100V, 115 V (STANDARD)
200V, & 230V	(OPTIONAL)
PERMISSIBLE LINE VOLTAGE VARIATION	+/- 10%
POWER	12W
FREQUENCY RANGE	48 - 62 Hz
LINE PROTECTION	HOT LINE IS FUSED & MOV
TRANSFORMER ISOLATION	2500 V RMS HIPOT

DISPLAY

CHANNELS	2 Scale (Plus 2 Level with RS-485 Option)
DIGITS	4 WITH RIGHT DECIMAL POINT, RED LED
SIZE	0.56" (readable from > 20 ft)
PUSH BUTTONS	4 PER CHANNEL: ZERO, SELECT, UP & DOWN
ANNUNCIATORS	4 PER CHANNEL: GROSS, TARE, REM (REMAINING), & LOW (LEVEL)

ENVIRONMENTAL & MISC.

CASE	Wall mount NEMA 4X, Fiberglass
TEMPERATURE RANGE	17 to 104 degrees F (-10 to 40°C)
SIZE	7.63" x 6.63" x 3.2"

OPERATING THE INDICATOR

INTRODUCTION

The EI-2000 instrument is a dual channel digital weight indicator. Each channel has its own digital readout and can display the weight of product GROSS, REMAINING, USED or TARE (See front panel). Every effort has been made to make the EI-2000 indicator easy to operate. A selection of operating Modes is available ranging from fully automatic to manual operation. In the automatic mode the EI-2000 calculates the container tare weight and displays the weight of product remaining or the amount used. In mode 4 the tare weight value of partially used containers can be entered manually. The EI-2000 also calculates and displays on a single readout the total weight of product available for two scales.

“Rate by Weight” is available as an option in all modes and can be accessed by the [SELECT] pushbutton.

OPERATING MODES

MODE 1: FULLY MANUAL MODE - Typical application: drum scales, bin and hopper scales. Remaining, tare, & gross weights are displayable.

1. Empty scale should read zero. If not, press ZERO pushbutton
2. Place container on scale
3. Press SELECTS to go to TARE
4. If necessary, adjust TARE.
5. Press SELECTS to go to REMAINING.

MODE 2: ADJUSTABLE REMAINING - Typical application: drum scales Remaining & gross weights are displayable.

1. Empty scale should read zero. If not, press the ZERO pushbutton.
2. Place container with product on the scale.
3. Instrument will show REMAINING weight and will flash the TARE annunciator.
4. Use the Up and Down arrow keys to adjust the remaining weight displayed.
5. Press the SELECT pushbutton, the REMAIN annunciators will stop flashing.

If you need to adjust the REMAINING weight again, press and hold either the UP or DOWN arrow pushbutton for 3 seconds, the REMAIN annunciator will start to flash and the remaining weight will now be adjustable, repeat steps 3 through 5 above.

See calibration section for calibration instructions.

CAUTION: IN MODE 2, THE DISPLAYED “REMAINING” VALUE CAN BE EASILY CHANGED TO GIVE AN ERRONEOUS READING. BEFORE REMOVING THE VALVE FROM AN “EMPTY” CYLINDER OR OPENING THE VALVE FOR ON A FULL CYLINDER, ALWAYS VERIFY REMAINING VALUE WITH THE GROSS WEIGHT.

TRUE REMAINING WEIGHT = “GROSS” WEIGHT - CYLINDER WEIGHT – VALVE WEIGHT.

MODE 3: AUTOMATIC OPERATION (requires full cylinder) - Typical application: chlorine gas cylinders. Remaining and gross weights are displayable.

1. Empty scale should read zero. If not, press the ZERO pushbutton.
2. Place a full container on the scale.
3. Gross annunciator will flash.
4. Adjust gross weight by using the UP and DOWN arrows.
5. Press SELECT, tare weight will be automatically calculated and stored in memory. The preset “START” value (configuration parameter #117 & #217) of remaining chlorine weight will now be displayed (REMAIN annunciator should be illuminated).

OPERATING THE INDICATOR

OPERATING MODES (Cont'd)

MODE 4: ADJUSTABLE GROSS - Typical application: partially used chlorine cylinders.

Remaining, tare, & gross weights are displayable.

1. Empty scale should read zero. If not, press the ZERO pushbutton.
2. Place a full container on the scale.
3. "GROSS" annunciator will flash.
4. Adjust gross weight by using the UP and DOWN arrows.
5. Press SELECT, tare will now be displayed (tare annunciator should be illuminated).
6. Adjust tare, as required, by using the UP and DOWN arrows.
7. Press SELECT, remaining will now be displayed (REMAIN annunciator should be illuminated).

MODE 5: AUTOMATIC REMAINING - Typical application: chlorine gas cylinders.

Remaining and gross weights are displayable.

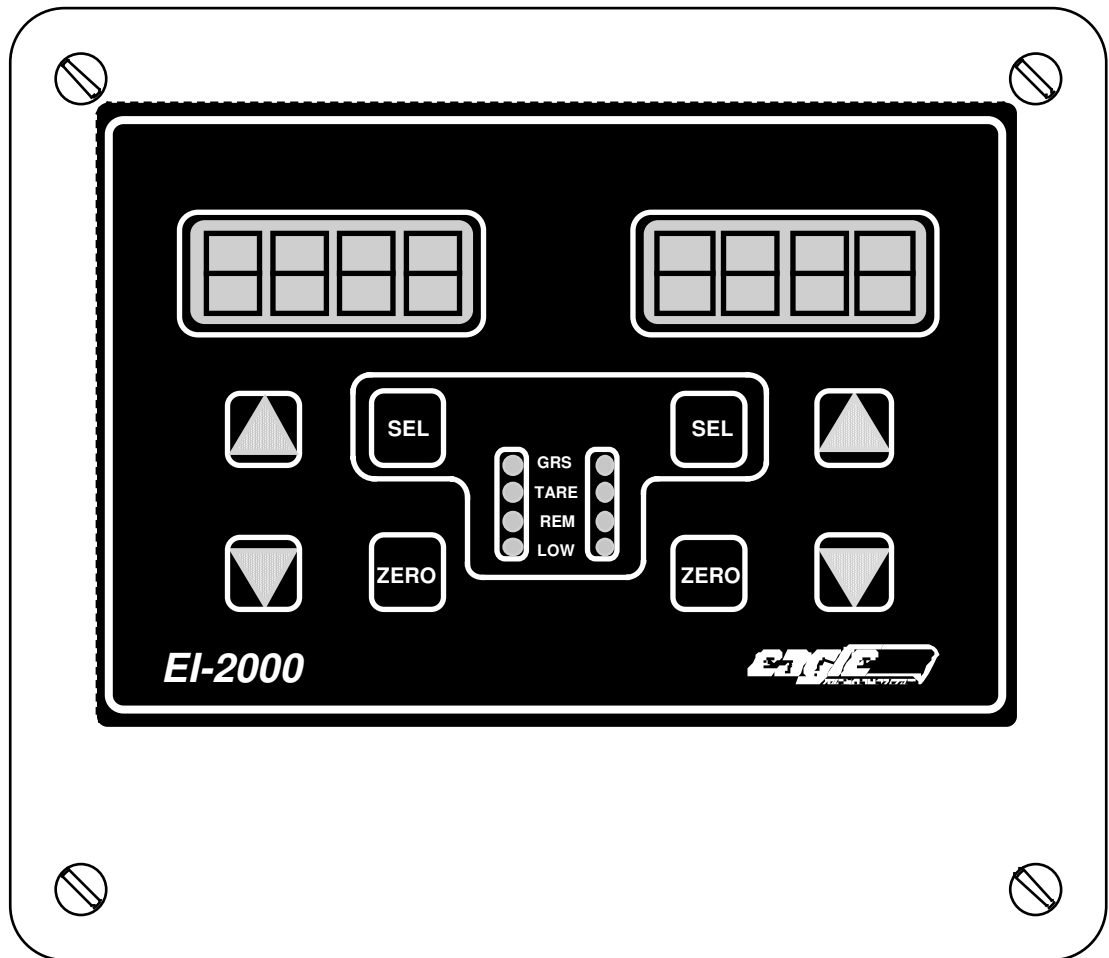
1. Empty scale should read zero. If not, press the ZERO pushbutton.
2. Place a full container on the scale.
3. "REMAIN" annunciator will light.
4. Use the Up and Down arrow keys to adjust the remaining weight displayed.
5. Select key will toggle display between "Gross" and "Remain".

Note: This operating mode mimics the standard modes of other manufacturers' scales. The ability to display the true "Gross" weight value allows the operator to verify the remaining value displayed. Overfilled cylinders can be detected.

CAUTION: IN MODE 5, THE DISPLAYED "REMAINING" VALUE CAN BE EASILY CHANGED TO GIVE AN ERRONEOUS READING. BEFORE REMOVING THE VALVE FROM AN "EMPTY" CYLINDER OR OPENING THE VALVE FOR ON A FULL CYLINDER, ALWAYS VERIFY REMAINING VALUE WITH THE GROSS WEIGHT.

TRUE REMAINING WEIGHT = "GROSS" WEIGHT - CYLINDER WEIGHT – VALVE WEIGHT.

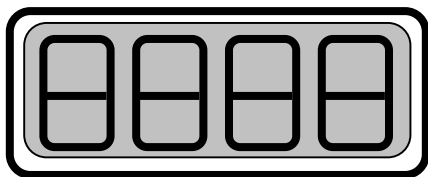
FRONT PANEL



Parameter "113" & "213" (Push to Zero) limit the amount of gross weight that can be zeroed out by the "ZERO" push button. The Push to Zero value can be increased or decreased in the configure mode. See "USER CONFIGURATION" pages 7-9.

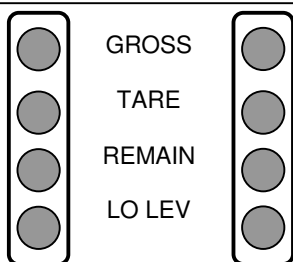
"Push to Tare" If the tare weight is displayable (in some operating modes, it is not), pressing both the UP & DOWN arrow keys will copy the gross weight into the tare register, this is a "push to tare" function.

FRONT PANEL DESCRIPTION



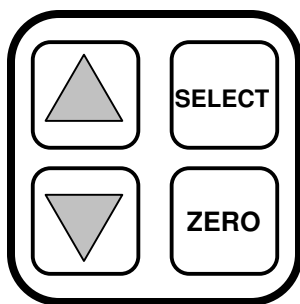
DIGITAL DISPLAY

The digital display provides a four digit readout of the GROSS weight (cylinder weight plus chemical weight), the weight of chemicals USED, or weight of chemicals REMAINING



ANNUNCIATORS

GROSS - When lit, the digital display represents the weight of chemicals plus the weight of the container.
TARE - when lit, the digital display represents the weight of container.
REMAINING - When lit, the digital display represents the amount of chemicals remaining in the container.
LO LEV - When lit, it indicates that the remaining chemicals are below the preset low level



PUSH BUTTONS

Two push-button clusters provide the user the ability to zero the scale, slew in the container tare weight or calibrate the indicator from the front panel without opening the instrument enclosure to the chemical environment.



(SELECT) - LEFT

Selects Gross, Tare (if enabled), and Net weights or Rate for display by left channel.



(SELECT) - RIGHT

Selects Gross, Tare (if enabled), and Net weights Rate for display by right channel.



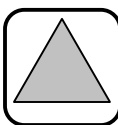
(ZERO) - LEFT

Zeros (Push to Zero) left channel gross weight if displayed and within the "Pt 0" limits.



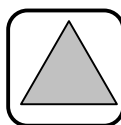
(ZERO) - RIGHT

Zeros (Push to Zero) right channel gross weight if displayed and within the "Pt 0" limits.



(UP ARROW) - LEFT

For some values that are displayed in the left display (i.e. tare), this increments the value.



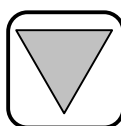
(UP ARROW) - RIGHT

For some values that are displayed in the right display (i.e. tare), this increments the value.



(DOWN ARROW) - LEFT

For some values that are displayed in the left display (i.e. tare), this decrements the value.



(DOWN ARROW) - RIGHT

For some values that are displayed in the right display (i.e. tare), this decrements the value.

CALIBRATION

SYSTEM CALIBRATION (S1-4 closed)**

Closing S1-4 will enable a calibration mode. Both GROSS annunciators flash to indicate calibration mode is enabled in both channels. You do not have to calibrate both channels at the same time. If one channel is already calibrated, and you do not press any push buttons for that channel, its calibration will not be altered.

The following outlines the calibration procedure; it applies to both channels (WORK WITH ONE CHANNEL AT A TIME):

1. S1-4 should be set to closed (on). Also, both GROSS annunciators will flash.
2. With NO REMOVABLE weight on the scale, press ZERO to obtain a zero reading. -0.5 to 3.0 mV/V can be zeroed; this is considered the dead load weight.
3. Place a known weight on the scale that is at least 20% of the full-scale weight. Of course, values of 50% to 100% will provide greater accuracy. Also, the indicator will not allow adjustments to the weight for values below 0.1% of the full-scale weight.
4. Using the UP/DOWN arrow keys slew in the correct weight value.
5. If desired, calibrate the other channel repeating steps 2 through 4 as before.
6. Open (or set to off) S1-4 to store new calibrations in memory.

**It is possible to calibrate the scale without closing S1-4. This is done by pressing and holding the left or right SELECT push-button for the channel that requires calibration for five seconds. When calibration is enabled, the GROSS LED will flash for that channel, release the SELECT push-button. Go through steps 2 through 5 above. NOTE: The "zero" in step 2 is limited by the "PT 0" parameter and is considered "push to zero" weight. When finished, press SELECTS to exit.

DIP SWITCH "S1"

Located inside the instrument are four DIP switches. (**S1-1, S1-2, S1-3, & S1-4**) These switches enable different functions of the instrument as indicated in the following list. It is not common to access these switches for "normal" operation.

SI	FUNCTION ON (CLOSED)	FUNCTION OFF (OPEN)
1	User configuration	Normal weigh mode
2	Analog output configuration	Normal weigh mode
3	Diagnostics	Normal weigh mode
4	Calibration enable	Normal weigh mode

See the following sections for more detailed information regarding configuring & calibrating the instrument.

USER CONFIGURATION (S1-1 closed)

Your instrument was configured at the factory & calibrated to match the type of scale specified. This section of the manual is used if the type of scale is changed or the application requires different functions than originally requested. [See the table below for push-button functionality. NOTE: Left zero, left select, right zero, right select have no function in configuration.

Left up and down arrow keys	select parameter
Right up and down arrow keys	alter the value of the parameter

PARAMETER "001" "xxxx" : OPERATION MODE

Selects an operating mode for the instrument. (See Operating Modes page 2).

PARAMETER "100" (LEFT), "200" (RIGHT) "xxxx" : AUTO CONFIGURE & CHANNEL ON/OFF

Selecting "Off" disables the channel.

Selecting "0 thru 7" will automatically preset factory parameters for some of the most popular scales shown under SCALE TYPE in the following list. Parameters denoted by an asterisk are not available when a specific scale is selected (>=1).

NOTE: Parameter "200" includes a selection "cy-1" which automatically copies values for "100" through "117" over to "200" through "217".

RIGHT DISPLAY READS	SCALE TYPE	"FS"*	"RES" (LBS)	"PT 0"* OR "D"	"AU 0"	"THR"* THRESHOLD	"STRT" TART REMAIN
0	USER (all functions avail.)	X	X	X	X	X	X
1	DCS302, ECS1502	300.0	0.5	2.0%	3.0d	20%	150.0
2	EDS400	400.0	0.5	2.0%	3.0d	20%	150.0
3	DS750	750	0.5	2.0%	3.0d	20%	150
4	WT3600 (1/channel)	4,000	5	10.0%	10.0d	20%	2,000
5	WT3600 (2/channel)	8,000	5	5.0%	10.0d	10%	4,000
6	LP4300 /4000lb.	2,000	1	10.0%	OFF	20%	Not set
7	LP4300/12000lb.	6,000	1	10.0%	OFF	20%	Not set

CONFIGURATION (S1-1 closed) (Cont'd)

PARAMETER: "110"(LEFT), "210"(RIGHT) "xxxx": FULL-SCALE*

Sets the maximum usable weight of the scale. Overload is set at approx. 103% of this value. The right display shows this value and has these choices: 100.0, 120.0, 150.0, 200.0, 250.0, 300.0, 350.0, 400.0, 450.0, 500.0, 600.0, 750.0, 800.0, 900.0, 1000, 1200, 1500, and 2000. 2500., 3000., 3500., 4000., 4500., 5000., 6000., 7500., 8000., 9000.

PARAMETER: "111"(LEFT), "211"(RIGHT) "xxxx": RESOLUTION OR COUNT BY

Sets the desired smallest part of the weight on the scale. This parameter can be changed without re-calibrating the scale. Selections available are 1, 2, 5, 0.1, 0.2, and 0.5. For a selected full-scale setting, only some of the resolution choices will be available so the graduations will not exceed 5000.

PARAMETER: "112"(LEFT), "212"(RIGHT) "xxxx": AVERAGING

Sets the samples accumulated before the display is updated. Selections are 1, 2, 4, 5, 8, 10, 12, and 16.

PARAMETER: "113"(LEFT), "213"(RIGHT): PUSH TO ZERO*

In percentage of full-scale, the amount of weight that can be zeroed by pressing the ZERO push-button while the instrument is in gross mode. Range 0% to the threshold value if defined.

PARAMETER: "114"(LEFT), "214"(RIGHT): AUTO ZERO*

In graduations (multiples of resolution) of full-scale, the amount of weight that can be zeroed automatically. Selections are off, 0.5, 1.0, 3.0, 5.0, & 10.0. For example, if the resolution is 0.5 (lbs) and the AZ is 3.0, 1.5 (lbs) can be zeroed automatically. No more than the value set by the "push to zero" parameter can be automatically zeroed (i.e. 2.0% of full-scale).

PARAMETER: "116"(LEFT), "216"(RIGHT): THRESHOLD*

In percentage of full-scale, in some operating modes (see parameter 001), this point defines when a load (i.e. bottle, tank, etc.) is placed on the scale (note: not available in all OPr modes).

PARAMETER: "117"(LEFT), "217"(RIGHT): START REMAINING WEIGHT

This value is equal to the amount of product contained in the new cylinder or tank after it is first placed on the scale. Operation mode 4, see further on, utilizes this parameter.

PARAMETER: "510"(LEFT), "520"(RIGHT)"xxxx": LOW-LEVEL SETPOINT

These are the low-level alarm set points for the left and right channels. If the remaining weight is equal to or below this value, the LOW LEV annunciator is illuminated and the optional dry contact is energized.

PARAMETER: "600": ANALOG OUTPUT SOURCE

Selects what the analog outputs represent: remaining weight (rE), gross weight (Gr), summation of left & right gross weights (Gr t), or summation of left & right remaining weights (rE t). **NOTE:** If a distance/level sensor is selected (See P800 & P820), the analogue output will represent the sensor value.

PARAMETER: "610"(LEFT), "620"(RIGHT)"xxxx" : ANALOG OUTPUT FULL SCALE

This sets the full-scale value for either the left or right weight (remaining or gross) or level that equals the analog output of 20.00 mA.

PARAMETER: "710" "xxxx": RS-485 NODE I.D.

Defines the node address of this EI-2000 on a multi-drop RS-485 network. Value = 1 through 16. Operation with an USL-100 level sensor overrides this function.

CONFIGURATION (S1-1closed) (Cont'd)

Parameters 800 through 831 apply if the output of one or two **USL-100 ultrasonic level sensors** are to be displayed and transmitted by the EI-2000. The RS-485 digital communication option and 24-volt power supply module option are required.

PARAMETER: "800"(LEFT), "820"(RIGHT): LEVEL SENSOR ON/OFF

Activates the left and/or right channel to display the output value of USL-100 digital ultrasonic level sensors. **NOTE:** If you will be using two sensors on one EI-2000, perform this initial configuration step with only one sensor connected at a time. Press the right "SELECT" key to assign an appropriate Node ID to the sensor.

PARAMETER: "801"(LEFT), "821"(RIGHT): LEVEL SENSOR BLANKING

See sensor manual.

PARAMETER: "802"(LEFT), "822"(RIGHT): LEVEL SENSOR PULSES

See sensor manual.

PARAMETER: "803"(LEFT), "823"(RIGHT): LEVEL SENSOR SENSITIVITY

See sensor manual.

PARAMETER: "804"(LEFT), "824"(RIGHT): LEVEL SENSOR DECIMAL POINT

Sets location of decimal point in level value display.

PARAMETER: "805"(LEFT), "825"(RIGHT): LEVEL SENSOR CALIBRATION

See sensor manual.

PARAMETER: "806"(LEFT), "826"(RIGHT): LEVEL SENSOR TEMP. COMP.

See sensor manual.

PARAMETER: "807"(LEFT), "827"(RIGHT): LEVEL SENSOR AVERAGING

See sensor manual.

PARAMETER: "808"(LEFT), "828"(RIGHT): LEVEL OUT OF RANGE SPAN

See sensor manual.

PARAMETER: "809"(LEFT), "829"(RIGHT): LEVEL OUT OF RANGE COUNT

See sensor manual.

PARAMETER: "810"(LEFT), "830"(RIGHT): LEVEL SENSOR SAMPLE RATE

See sensor manual.

PARAMETER: "811"(LEFT), "831"(RIGHT): LEVEL VALUE INVERT

See sensor manual.

ANALOG OUTPUT CONFIGURATION (S1-2 Closed)

This mode (S1-2=ON) allows access to analog parameters. These parameters are used to calibrate the 4 - 20mA analog output values for each channel. See the table below for push-button functionality.

NOTE: Left zero, left select, right zero & right select have no function in Analog Output Configuration.

Left, up and down arrow keys	Select a parameter
Right, up and down arrow keys	Alter the value of the parameter

PARAMETER: **"DAC " "xx.xx"**

This parameter tests both Digital to Analog Converters in linear 10 steps from 4.00 mA to 20.00 mA.

PARAMETER: **"AO L" " 4.00"** (ANALOG OUTPUT LEFT 4.00 mA ADJUSTMENT)

Set the left 4.00 mA analog output point using the right up & down arrow push buttons. The display will not show any indication that the left analog output is changing which is why one should have a "mA" meter (i.e. DMM) connected to J3-1 & J3-2. The mA output range is approximately 4.0 mA +/- 1.0 mA.

PARAMETER: **"AO L" "20.00"** (ANALOG OUTPUT LEFT 20.00 mA (SPAN) ADJUSTMENT)

Set the left 20.00 mA analog output point using the right up & down arrow push buttons. The display will not show any indication that the left analog output is changing which is why one should have a "mA" meter (i.e. DMM) connected to J3-1 & J3-2. The mA output range is approximately 20.0 mA +/- 1.0 mA.

PARAMETER: **"AO r" " 4.00"** (ANALOG OUTPUT RIGHT 4.00 mA ADJUSTMENT)

Similar to "AO L" "4.00" except for the right channel, see "AO L" "4.00" above.

PARAMETER: **"AO r" "20.00"** (ANALOG OUTPUT RIGHT 20.00 mA (SPAN) ADJUSTMENT)

Similar to "AO L" "20.00" except for the right channel, see "AO L" "20.00" above.

PARAMETER: **"CLIP" "xxxx"** (CLIP ANALOG OUTPUTS)

Use this to clip or limit the analog output to the 4.00 to 20.00 mA boundaries. If off, the analog output can go above 20 mA (up to 20.5) to detect an overload and below 4.00 mA (as low as 3.5 mA) to detect if the scale is empty (analog output must be representing remaining weight with some tare in this example). This could be useful in some applications. Range: "On" (clip) or "OFF" (don't clip). Default: "On"

DIAGNOSTICS

DIAGNOSTICS (S1-3 closed)

This mode allows access to special parameters. Altering these parameters can alter the calibration so that the EI's readings may not be correct. The only way to access them is by closing S1-3 closed. See the table below for push-button functionality. NOTE: Left zero, left select, right select have no function in the "Diagnostic" mode.

Left, up and down arrow keys	Select a parameter
Right, up and down arrow keys	Alter the value of the parameter.
Right zero	Reset to default. See def. below

DEFINITION:

"RESET TO DEFAULT" – "Right Zero" will reset the selected "dead zero", "push to zero", or "auto zero" registers value to the original factory settings (0.000 mV/V).

PARAMETER: "LL x." "xxxx"

PARAMETER: "Lr x." "xxxx"

For display only, shows either the left or the right load cell input in mV/V units. The acceptable value range is -0.4 mV/V to 3.3000 mV/V. The accuracy of this value is typically 0.1%.

PARAMETER: "CL x." "xxxx"

PARAMETER: "Cr x." "xxxx"

Display/adjust left or right calibration value in mV/V units. When the left or right channel is calibrated, the mV/V span value is shown here. Be careful since this value can be altered! The typical range is from 0.5000 to 3.0000 mV/V. pressing the RIGHT ZERO push-button will set it to a default value.

PARAMETER: "dL x." "xxxx"

PARAMETER: "dr x." "xxxx"

Display/adjust left or right dead-zero value in mV/V units. This is the value entered when one is in the calibration mode (via S1-4=ON), and it has limits of -0.5 to 3.0 mV/V. Pressing the RIGHT ZERO push-button clears the value to 0.0000 mV/V.

PARAMETER: "PL x." "xxxx"

PARAMETER: "Pr x." "xxxx"

The left or right Push to Zero (PTZ) value in mV/V is stored here. Pressing the RIGHT ZERO push-button clears it to 0 mV/V, it cannot be set to any other value.

PARAMETER "AL x." "xxxx"

PARAMETER "Ar x." "xxxx"

This is the mV/V of the auto zero for the left or right channel. The RIGHT ZERO push-button clears this to zero, it cannot be set to any other value.

PARAMETER: "GL" "xxx.x"

PARAMETER: "Gr" "xxx.x"

Displays the approximate left or right microvolt per graduation (grad) value. The acceptable range is from 1.0 micro volts/grad to 100.0 micro volts/grad.

SPECIAL "POWER UP" FUNCTIONS

PRESS AND HOLD KEY DURING POWER UP	RESULT
LEFT SELECT	Reset to FACTORY DEFAULT , does not destroy a/d, d/a calibration.
RIGHT UP ARROW	Reset to FIRST INITIALIZE... CAUTION! See below.
LEFT UP ARROW	Hold display test.

"FRST INIT" (First Initialize) function resets **ALL** configuration and calibration values to default. Complete re-configuration and re-calibration of the instrument will be required. Use of the "factory default" function will maintain calibration and reload typical value for the chosen scale.

MESSAGES

POWER UP MESSAGES

INIT	Initializing indicator
AUTO INIT	Automatically initializing indicator.
8.8.8.8.8.8.8.8.	Lamp test.
A2D CAL	The analog to digital converter is self-calibrating.

HARDWARE FAILURES

EE VRFY	EEPROM verify failure.
EE ACK	EEPROM detection failure.
EE CS	EEPROM checksum failure.
A2d.Err	A/D detection failure.

ERROR MESSAGES

NOTE: If errors 1 - 6 below occur, the scale should be recalibrated.

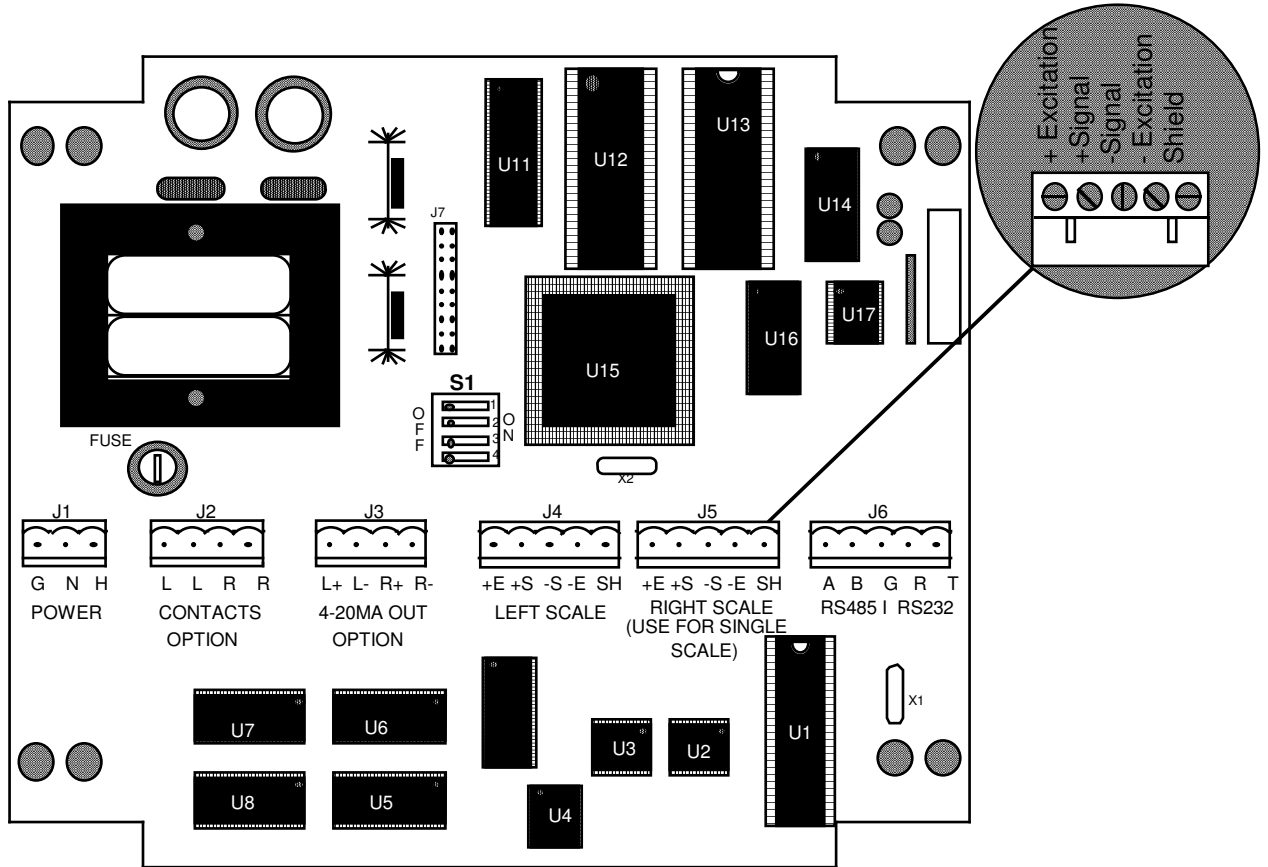
Er 0	Can't push to zero because the limit will be (or has been) exceeded.
Er 1	Span value error.
Er 2	Dead zero value error.
Er 3	Auto zero value error.
Er 4	Push to zero value error.
Er 5	Calibration boundary violation: Zero + span value exceeds the capabilities of the instrument.
Er 6	The microvolt per graduation rule of no less than 0.5 is violated.

WEIGHT OVERLOAD

UL	Weight is less than -1% of the weigh range.
OL	Weight is greater than 103 % of the weigh range.
A OL	Positive A/D overload (> 3.3 mV/V in) could be a damaged load cell or bad wiring.
A-OL	Negative A/D overload (< 0.40 mV/V in), could be a damaged load cell or bad wiring.
r UL	Remaining weight is less than -999 (-99.9).

FIELD WIRING

EI-2000 CPU BOARD

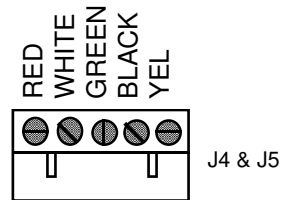


CONNECTION	FUNCTION
J1	117 V AC Power input
J2	Left channel and Right channel relay contacts (Option).
J3	Left channel and Right channel analog output.
J4	Left scale connector.
J5	Right scale connector.
J6	RS485/RS232 communication connector (Option).

NOTE: FOR SINGLE CHANNEL APPLICATIONS USE THE LEFT OR RIGHT CHANNEL INPUT AND DISABLE THE UNUSED DISPLAY WITH PARAMETER "100" and "200" IN THE CONFIGURE MODE. **JUMPER THE UNUSED CHANNEL "+ SIG", "- SIG" AND "SHIELD" TOGETHER.**

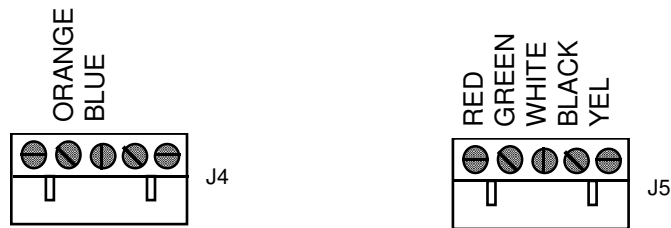
CONNECTOR WIRING

ECS-1501, ECS-1502 and ECS-400 CYLINDER SCALE



ECS1500 series Load Cell

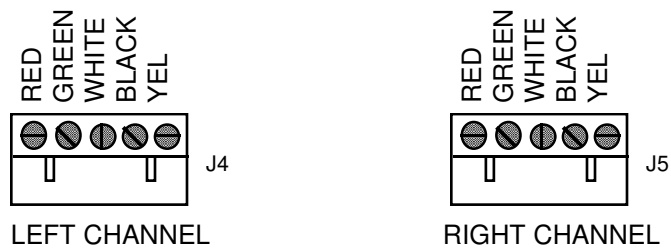
DCS302 DUAL CYLINDER SCALE



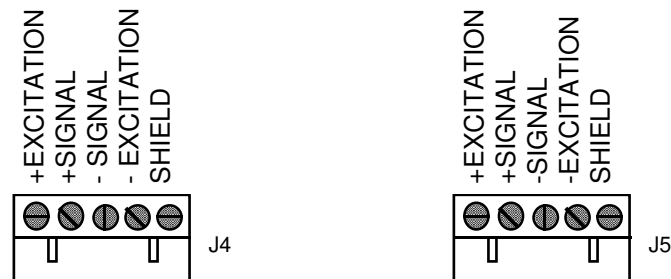
DCS302 Load Cell

DCS302 dual cylinder scales field wiring: Use J5 connector for Red, Green, White, Black and Yellow wires. Use J4 connector for Blue (- signal) and Orange (+ signal) wires.

EDS400, DS750, LP4300, WP1000, CXX00P AND WT3600 SCALES

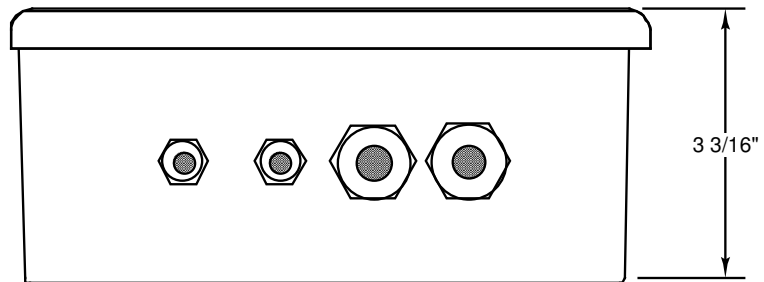
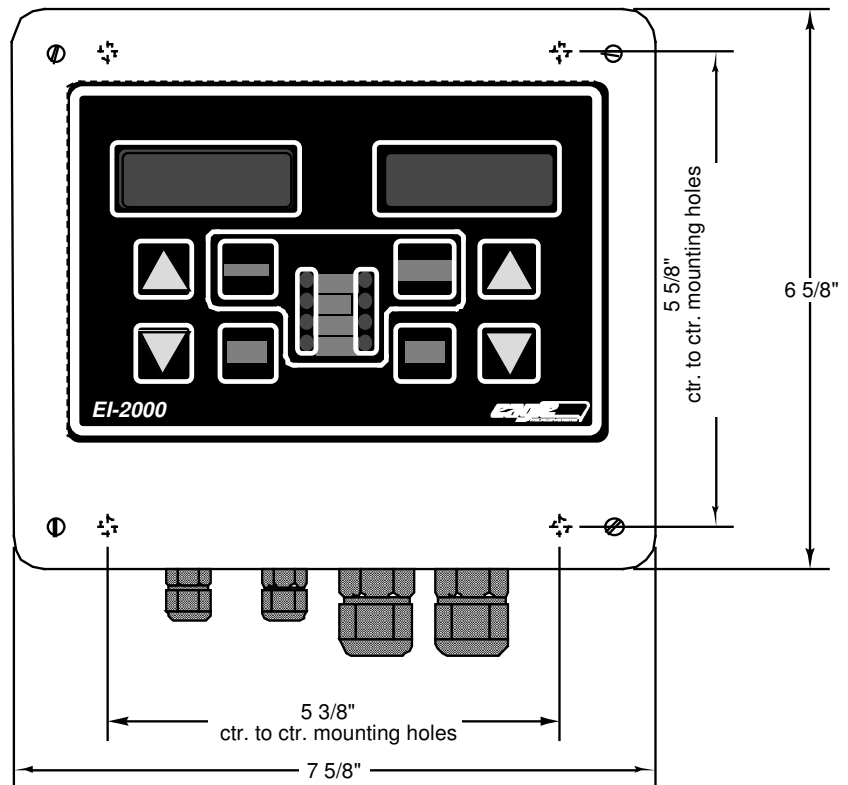


BIN AND HOPPER SCALES



INSTALLATION

Wall Mounting Dimensions



Enclosure conforms to: NEMA 4X

SPARE PARTS

1. INDICATOR CPU BOARD: EAGLE P/N 110267
2. INDICATOR DISPLAY BOARD: P/N 110266

EI2000 - O&M-v3.0
Revised 12/2/04