Analog Output
Manual EZIII
Operator/Installer

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ANALOG OUTPUT OPTION

The Analog Output Option provides an analog signal that is proportional to the scale weight. The option is normally configured as 4-20mA with 0mA providing an error indication.   4- 20mA or 0 -5V operation without error indication is optional.   This option can be added to any EZIII series indicator. The signal will be supplied through J904 or J905 connector. Contact 1 = Signal, contact 8 = ground.

Setup

After setting up your EZ indicator for proper operation, four more parameters are required for the analog output feature to function properly (**"ZEROUT", "LOW WT", "HIGHWT", "ANALOG"**).

> **CAUTION:**   Changing scale setup parameters ("**ZEROUT**" "**LOW WT**", "**HIGHWT**","**lb-kg**", "**ANALOG**" etc.) will
> ⚠   change the analog output signal.

Zero balances the scale:

> *Before setting the analog parameters make sure the scale has been zero balanced. This should be done when the scale is empty by pressing and holding the zero key.*

Zero Output "zerout":

*Normally "**zerout**" is set while the load cells are connected and the scale is empty. This matches the minimum analog output signal with no weight on the scale.*

Low Weight "LOW WT",

Low weight is the weight where the analog output is 4mA or 0V.

High Weight HIghWT":

High weight is the weight where the analog output is 20mA or 5V.

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Analog Mode "`Analog`":

> *Analog mode chooses between the available output modes:*
> *0-20mA with error indication (Default), 4-20mA, or 0-5V.*
> *This setting must match the hardware jumper settings.*

Examples

Example 1: Scale with 10000 kg capacity, Analog Output set to output 4mA at 0 kg and 20 mA at 10000 kg.

With the scale empty, perform a Zero/Balance for the scale display.

With the scale empty, set "`zerout`" so that the Analog Output zero is the same as the display zero.

Set "`low wt`" to 0.

Set "`HIGHWT`" to 10000.

Example 2: Scale with 20000 kg capacity, Analog Output set to output 4mA at 5000 kg and 20ma at 16000 kg.

With the scale empty, perform a Zero/Balance for the scale display.

With the scale empty, set "`zerout`" so that the Analog Output zero is the same as the display zero.

Set "`low wt`" to 5000.

Set "`HIGHWT`" to 16000.

How to set ZEROUT, LOW WT and HIGHWT

NOTE: Zero Output "`zerout`" must be set while the load cells are connected and the scale is empty.

EZ2400(V):
1. Enter the long form setup by pressing and holding the **Net-Gross** and then the **On** key. Hold both keys for 3 seconds.
2. The display will show: "`PRESS SELECT OR GROSS FOR MENU 1-2-3-4-CALIB.-EXIT`"
3. Press **Select** twice to go to menu 2.
4. Press several times the **On** key until the display shows "`zerout`" followed by a value.
5. With the scale empty press the **Zero** key. The display will show "`zero`" followed by `0`.
6. Press **On** to confirm and advance to the next parameter.
7. Press **On** a few more times until the display shows Low Weight "`low wt`".
8. Enter the weight where the analog output signal should be 4mA or 0V. (Use the **Select** key to increase the flashing digit and the **Function** key to select which digit is flashing)
9. Press **On** to confirm and advance to High Weight "`highwt`".
10. Enter the weight where the analog output signal should be 20mA or 5V. (Use the **Select** key to increase the flashing digit and the **Function** key to select which digit is flashing)
11. Press **On** to confirm.
12. Exit the long form setup by pressing and holding the **Tare** key and pressing the **On** key.

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EZ3400(V) and EZ3600(V)

1. Enter code 219 on the numeric keypad then press **Select**.
2. The display will show "`zerout`" followed by a value.
3. With the scale empty press the **Zero** key.
4. The display will show "`zero`" and will return to its standard weighing mode.
5. Enter code 241 on the numeric keypad then press **Select**. The display will show "`low wt`" (low weight) followed by a value.
6. Use the numeric keypad to enter the weight where the analog output signal should be 4mA or 0V.
7. Press **On** to confirm.
8. Enter code 242 on the numeric keypad then press **Select**. The display will show "`highwt`" (high weight) followed by a value.
9. Use the numeric keypad to enter the weight where the analog output signal should be 20 mA or 5V.
10. Press **On** to confirm.

Analog Output Signal

The Analog Output is updated 10 times a second and reflects the "Analog Output Gross Weight" value which is derived using "`ZEROUT`", "`LOW WT`", "`HIGHWT`" and "`ANALOG`" values. The analog output will not necessarily follow the value displayed on the indicator.

The "Analog Output Gross Weight" is not affected when the operator performs a normal "Zero/Balance" of the display.

The "Analog Output Gross Weight" will always be gross and does not change when the operator selects the Net or Load/Unload weight to be displayed.

Calculating the Output Value

If the "Analog Output Gross Weight" is between `"LOW WT"` and `"HIGHWT"`, the following calculation determines the Analog Output Signal:

$$4mA + \frac{(16mA*(\text{Analog Output Gross Weight} - \text{"Low Wt"})}{(\text{"HIGHWT"} - \text{"Low Wt"})}$$

The minimum analog output value is 4mA or 0V.

If the "Analog Output Gross Weight" is less than `"Low Wt"`, the Analog Output Signal will be 4mA or 0V.

The maximum analog output value is 20mA or 5V.

If the "Analog Output Gross Weight" is greater than `"HighWt"`, the Analog Output Signal will be 20mA or 5V.

Special Circumstances

1. The analog output will hold its present level when operator enters the menus to change the scale's setup parameters.

2. The analog output will hold its present level during indicator temperature calibration process (which can take up to 3 seconds). Temperature calibration normally occurs every 20 minutes, but occurs more often during the first 20 minutes of operation.

3. When D.A.N. 243 = "0-20mA" 4-20mA output signal with 0mA in an error situation.

    When D.A.N. 243=" 4-20mA" 4-20mA output signal without error signal.

    When D.A.N. 243="0- 5V" 0-5V output signal without error signal.

4. An error condition exists if `"zerout"` has not been set.

5. An error condition exists if `"low wt"` is larger than the `"High Wt"`.

6. An error condition exists if the scale has an analog error (`"AD ERR"`).

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Specifications

Operating Temp. Range: -30 to +40 degree C

Output Signal:

0-20mA (Default)

4-20mA (optional) or 0 to 5V (optional)

0-20mA or 4-20mA Output Load Resistance: < 350 ohm

Resolution: 16 bits, 1LSB = 0.0015% of full scale range where 1 LSB =244 nA or 7.5 mV

Nonlinearity: < +/- 0.012%

Gain plus Offset Error: +/- 0.15% max.

Temperature Drift: 50 ppm/degree C, 0.35% max.

Update rate: 10 times per second

Calibration

Calibration is an iterative process alternating between the "MIN" and "MAX" because offset adjustments affect the gain and gain adjustments affect the offset.

Enter the Analog Output Test mode.

Select the "MIN" mode and adjust the Offset potentiometer (R1) on the Analog Output PCB assembly to get 0.0000 mA(0.0000V).

Select the "MAX" mode and adjust the Gain potentiometer (R3) to get 20.000mA(5.0000V).

Repeat steps 1 and 2 until adjustments are not needed.