

MOOG

NE124-204 Series Temposonics™ Signal Conditioner

SPECIFICATIONS

Electrical Stroke: From 2 inches to 100 inches	Ripple: Less than 0.8% of full output
Zero Output: Either end of transducer (factory set)	Output Voltage: 0 to +10 VDC (bipolar also available)
Zero Adjustment: Nominal 2% of full stroke	Special Output: Pulse width modulated output (0V to +12V)
Linearity: Less than $\pm 0.05\%$ of full stroke	Temperature Range: 0°C (32°F) to 50°C (122°F)
Repeatability: Better than $\pm 0.02\%$ of full stroke	Connector: DIN 41612 C
Temperature Coefficient: 0.013% per degree C	Form Factor: Eurocard 100 x 160 mm, 7 HP, 3 U
Frequency Response: Typical 400 Hz for 20 inch stroke	Weight: 0.38 lb (0.17 kg)

The Temposonics™ Signal Conditioner card is designed to provide the necessary power supplies and signal conditioning to drive a range of Temposonics™ transducers. The card is factory set to drive a specific stroke length. Trimpots, which adjust zero and gain, are used to compensate for minor differences between transducers of the same nominal stroke length. Transducer position is represented by an analog voltage. The inverse of this voltage and a pulse width modulated signal are also available.

The NE124-204 Temposonics™ Signal Conditioner card is a forward compatible replacement for the E124-204.

FEATURES

- Analog output
- Infinite resolution
- Absolute measurement
- Zero adjustment
- Gain control
- ± 15 VDC supplies
- PWM output

ORDER NUMBER

NE124-204-x (consult factory)

FUNCTION SELECTION

J1 Analog Output Jumper: Select 'on' for DC analog output at Pin-25 and Pin-32. Select 'off' for DC analog output on Pin-25 only. (Factory set for Pin-25.)

J2 Inverse Analog Output Jumper: Select 'on' for inverse analog output at Pin-27 and Pin-31. Select 'off' for inverse analog output on Pin-27 only. (Factory set for Pin-27.)

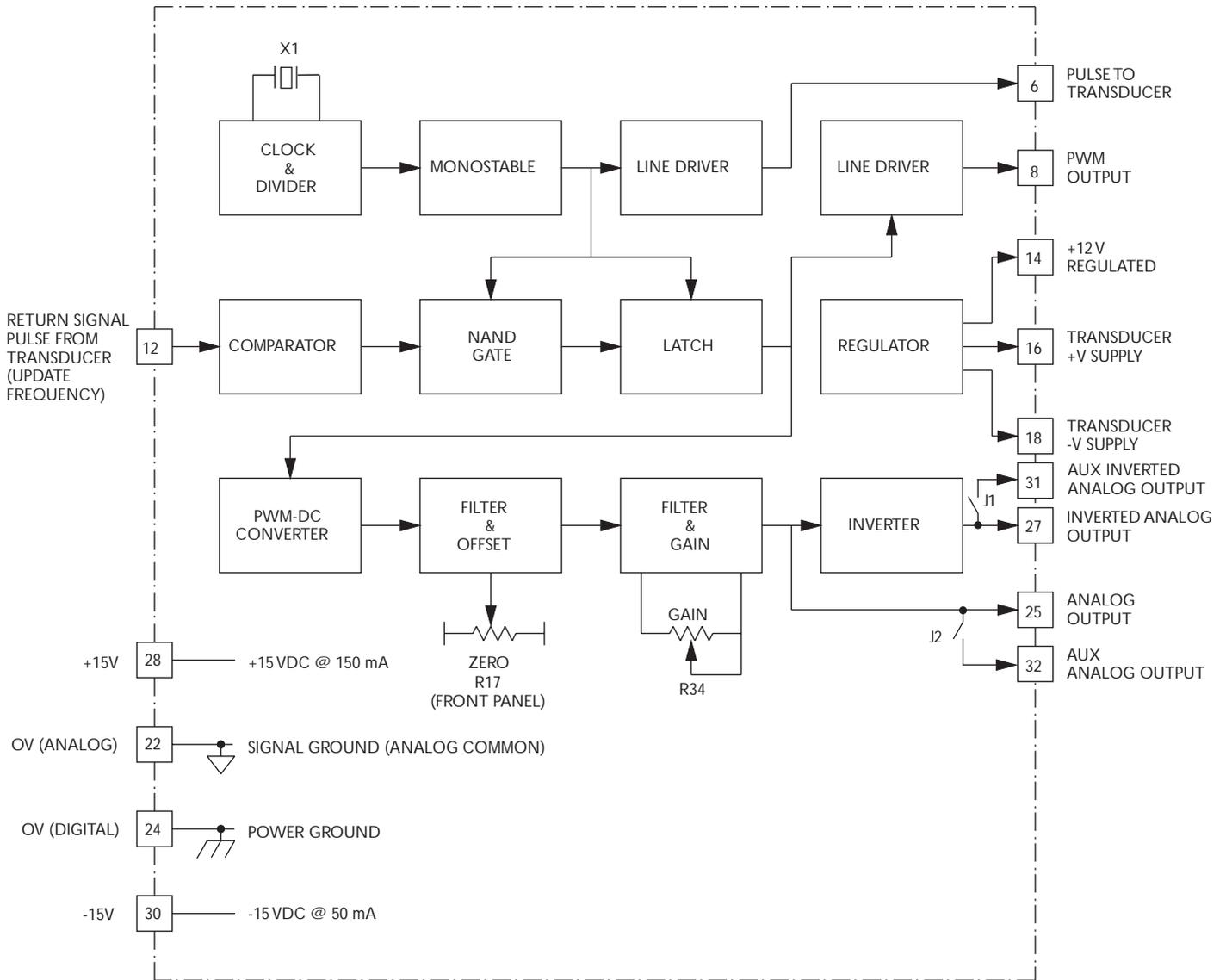


ADJUSTMENTS

Zero (R17) – Adjusts null of outputs for zero transducer conditions. Used for 'fine' tuning the DC analog output at full retract and full extend positions. (Factory set – front panel access)

Gain (R34) – Adjusts gain to the exact output option change for a zero to full displacement magnet movement. Used for 'fine' tuning the DC analog output at full retract and full extend positions. (Factory set – PCB mtg. only – not accessible on front panel)

NE124-204 TEMPOSONICS™ SIGNAL CONDITIONER BLOCK DIAGRAM



Tempsonics™ is a trademark of MTS Systems Corp., Sensors Division.

NOTES:
1. X1 - INDICATES CRYSTAL

CIRCUITRY: OPERATION

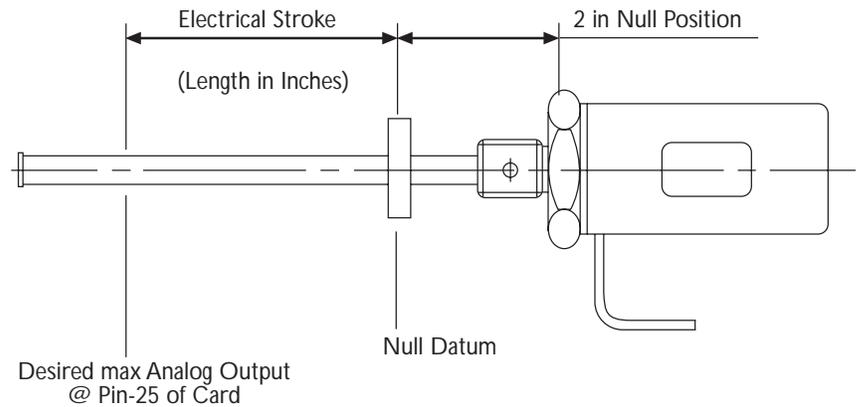
The NE124-204 Signal Conditioner Card provides the necessary power supplies and signal conditioning to drive a range of 'Temposonic' transducers. Each circuit card is factory set to drive a specific stroke length. Trimpots, which adjust Zero and Gain, are used to compensate for minor differences between transducers of the same nominal stroke length. Transducer position is represented by an analog voltage. The inverse of this voltage and a pulse width modulated (PWM) signal are also available.

This card has been designed to be used with MTS Sensor Division Linear Position Transducer products. Each card consists of a power regulator section, pulse generator section and a Pulse Width Modulation (PWM) to DC Converter section.

The DC power regulation section generates the +12VDC and ± 15 VDC needed to operate the position transducer. The pulse generation section develops a 'one-microsecond' (1 μ s) pulse at the proper frequency for each particular length and drives it to the transducer. The returned 'echo' pulse from the transducer is compared and converted into an Analog DC level signal which can be directly used for 'closed-loop' system operations. The card also has 'Zero' and 'Gain' adjustments for 'fine' tuning the DC Analog Output at full retract and full extend positions respectively.

Note: All Intrinsically safe probes of any stroke and all standard probes ≥ 12 in stroke require a 'positive' pulse to the transducer. Standard transducers with strokes < 12 in require a 'negative' pulse.

TYPICAL TRANSDUCER: STANDARD MAGNET DATUM



CARD SETUP INSTRUCTIONS: NEW STROKE LENGTH

(PERFORMED BY MOOG-ICD ENGINEERING)

1. Establish Clock Period and Pulse Sense
2. Set Zero Position (R17/Front Panel)
3. Set 'Square/Triangle' Converter
4. Set 2nd Order Filter Values (R26, R27)
5. Set Gain of Stage IC8A (R34 Gain Pot – Available on PCB)
6. Final Setting – Adjust Gain pot (R34) as required
7. Determine 'Noise' Measurement
8. Define Line Driving Capability – Cable Length

TECHNICAL

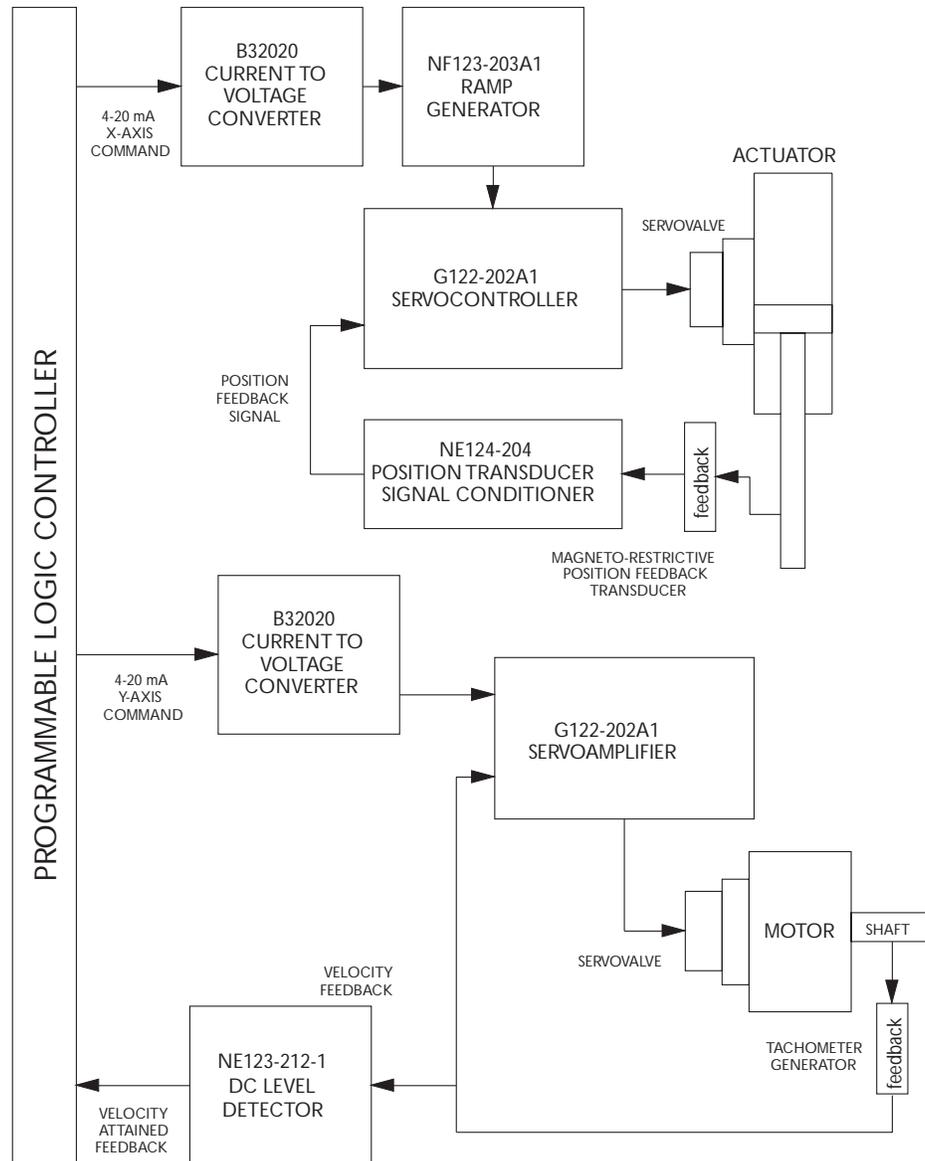
- Crystal Frequency (X1) = $F \leq D / (G \times S \times 1.1)$ where
D = Crystal 'divided by' Constant
G = Temposonic Gradient
S = Transducer electrical stroke
- DC Gain @ IC8A = $(R29 + R28) / R28$ - Monitored @ Pin-25

TWO AXIS PROGRAMMABLE LOGIC CONTROLLER (PLC) SERVO SYSTEM

A two-axis system can be configured so that all analog signal processing takes place using electronics in order to utilize a controller having only discrete inputs/outputs.

For the linear Y-axis servo, the Current to Voltage Converter interfaces between the 4mA-20mA current command source from a Programmable Logic Controller (PLC) and the voltage input of the Ramp Generator. The Ramp Generator provides variable acceleration/deceleration control in response to a step input. The servoamplifier, in conjunction with the position feedback transducer and conditioning electronics, provides closed-loop control of the valve and actuator. In addition, the servoamplifier provides DC source power to all analog servoelectronics.

Eurocard Example



Suggested Setup Procedure:

Consult the factory.

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