

Linear Link®

High Performance Turbine Meter System

Description

The Linear Link® is a high performance turbine flowmeter linearizer which has redefined the methodology for optimum linearization. Based on measuring the time between turbine rotor blades, the Linear Link® can output “real time” corrected K-factor flow data in 10 mS, with an accuracy of $\pm 0.1\%$ of reading over the full repeatable range of the flowmeter. This wide turndown is made possible by a unique approach that enhances resolution in the low flow range of the turbine meter where linearization is critical.



The Linear Link® is available in a compact monobody pickoff design or remote enclosures,

including NEMA 4X, aluminum and explosion-proof. The revolutionary level of compactness of the Linear Link's® integral, monobody design allows for installation where space is limited, and also eliminates the confusion of matching electronics to the appropriate flowmeter. When the operating temperature exceeds the limits of the electronics or the application requires an industrial enclosure, the system's remote enclosure options provide the solution.

Putting It To Work

The Linear Link® operates on a wide 10–32 VDC power input, making it ideal for on-board vehicle testing in the automotive and aircraft industries, and engine test stands in the aerospace industry. The outputs available are a raw flow meter frequency, a linearized frequency, and a choice of linearized analog voltage or current outputs.



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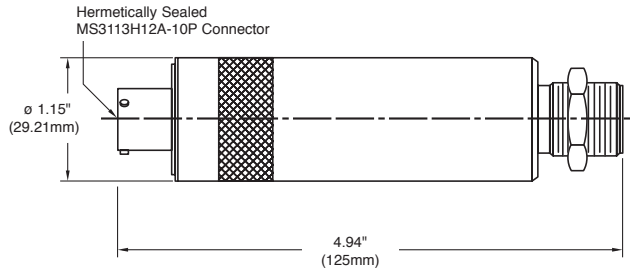
Features

- Available in a compact monobody or remote enclosure mounting
- Linearizes outputs to $\pm 0.1\%$ of reading over the maximum repeatable range of the flowmeter
- Fast 10 mS linearized frequency response
- Operates from 10–32 VDC power
- Simultaneous frequency and analog outputs
- Combines linearization and analog converter in one compact package
- Provides user-selectable K-factor outputs for ease of replacement
- Reduces space requirements and cost of installation
- Fully-programmable and scalable through user-friendly Windows® software, via serial communication
- Compliant with EMC Directive 2004/108/EC per EN 61326

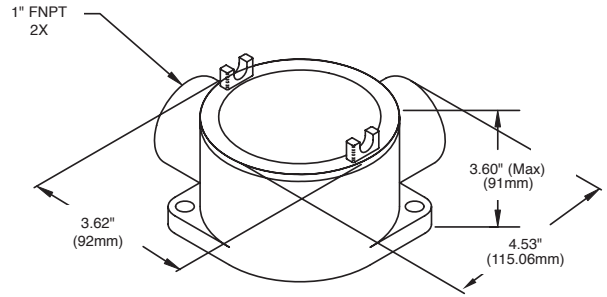
Mechanical Dimensions

Drawings not to scale.

**Integral Monobody Pickoff
(-1 enclosure)**

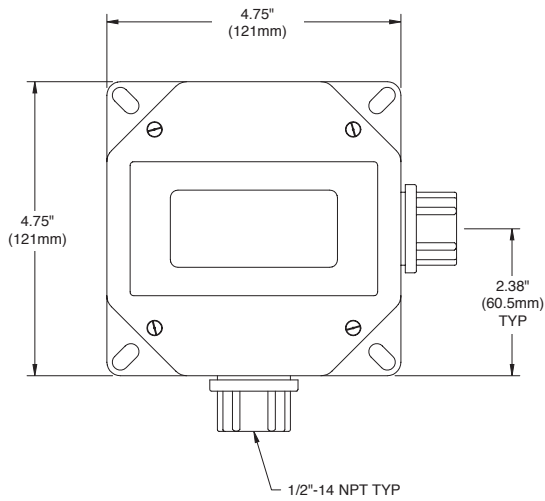


**Explosion-Proof
(-9 enclosure)**



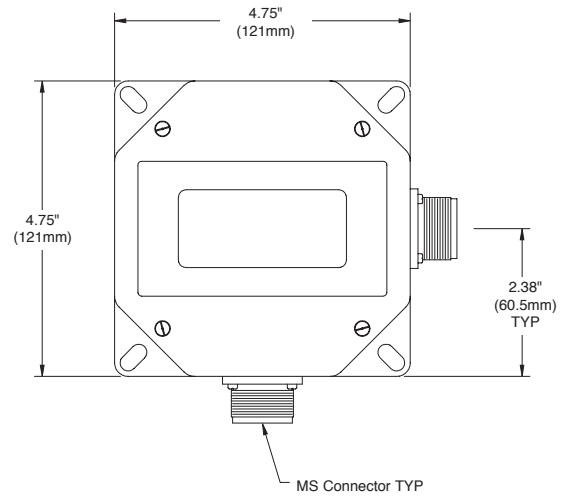
**NEMA 4X, 1/2" Conduit Connections
(B6 or BC enclosure)**

3.00" (75.5mm) ENCLOSURE HEIGHT

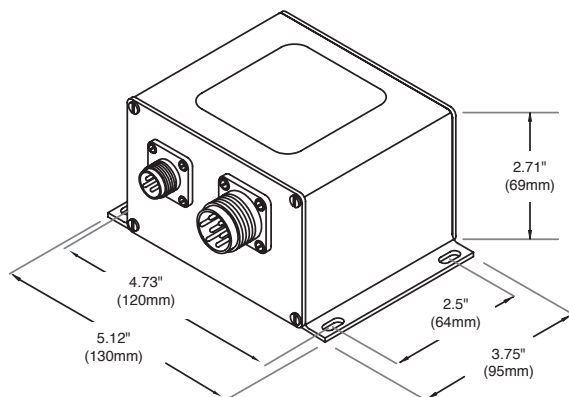


**NEMA 4X, MS Connections
(B7 or BA enclosure)**

3.00" (75.5mm) ENCLOSURE HEIGHT

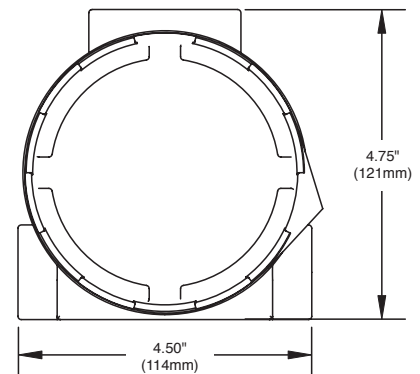


**Dusttight Aluminum, MS Connectors
(A7 enclosure)**



**Flameproof
(-F enclosure)**

3.55" (90.2mm) ENCLOSURE HEIGHT



Specifications

Input	Mag and RF and Pulse
Frequency	5–3,500 Hz
Mag. Input Sensitivity	20 mV p-p (below 100 Hz)

Output	
Frequency Amp.	0–5 VDC square-wave
Frequency	1–3,500 Hz (linearized) (2000 Hz standard)
Analog Voltage	0–10 VDC (zero offset <25 mV)
Analog Current	4–20 mA

Applied Voltage In 10–32 VDC

- Notes: 1) 15–32 VDC power required for 4–20mA output
 2) Load resistance range at 15 VDC is 200 to 550 ohms
 3) If load resistance is above 550 ohms, use the following formula to calculate minimum supply voltage:
 $R_{load} = (\text{supply voltage} - 4)/0.02$

Typical Power Consumption 300 mW

Linearization Latency $\frac{N}{\text{input Hz}} + 10 \text{ mSec} < 1000 \text{ Hz}$

$\frac{3 + N}{\text{input Hz}} + 10 \text{ mSec} > 1000 \text{ Hz}$

N = blade average factor
 4 = default blade average factor

Electronics Accuracy	
Frequency Output	±0.1% of reading
Analog Output	±0.1% of full scale

Linearization Method Linear or cubic spline interpolation

Reprogrammability 1 million cycles

Operating Temperature -40° F to +185° F
 (-40° C to +85° C)

Interface Two-wire 19.2 Kbps serial
 USART connection to PC
 (with special cable adapter)

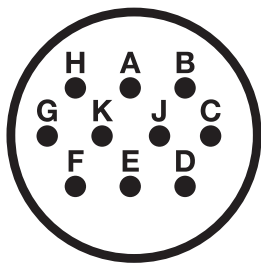
Approvals	
Intrinsically Safe	Class I, Div. 1, Groups A, B, C & D FM (Enclosure option 1 only)
Increased Safety	EEx nC e IIC T5 G3 (Enclosure option FCFP only)

Compliance EMC Directive 2004/108/EC
 CE EMC per EN 61326
 (not available on -1 enclosure option)

Optional Display See Universal Display data
 bulletin for specifications

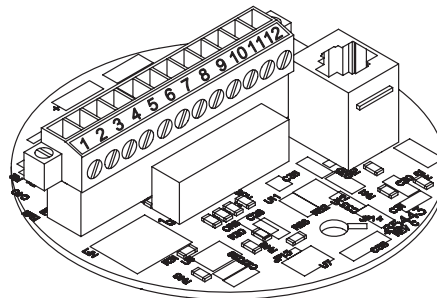
Wiring Diagram

Monobody Pickoff



Pin	Function
A	10 to 32 VDC
B	Common
C	TX
D	RX
E	Linearized Frequency +
F	Raw Frequency +
G	Voltage Out +
H	Current Out +
J	Not used
K	Not used

Remote Enclosure PCB



Terminal	Linear Link Function
1	Power Supply, 10 to 32 VDC
2	Power Supply Return
3	(+) XDCR, Pick-off Input
4	(-) XDCR, Pick-off Input
5	Linearized Frequency, 0–5 V Pulse +
6	Raw Frequency, 0–5 V Pulse +
7	Voltage Output, 0–10 VDC +
8	Current Output, 4–20mA +
9	Circuit Common
10	Circuit Common
11	Circuit Common
12	Circuit Common

Model Numbering System

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Basic Model No.

Power

5 = 10–32 VDC

Signal Input

A = Magnetic
B = Pulse
C = RF Carrier

Analog Output

V1 = 0–10 VDC
MA = 4–20mA

Note: Minimum input power required for
4–20mA output is 15 VDC

Enclosure

– 0 = No Enclosure (n/a with pickoff version)
– 1 = Integral Pickoff 10-Pin MS
(CE compliance not available)
– 9 = Crouse-Hinds EABL36SA
– F = Adalet XIHFCX3
A7 = Aluminum with MS Connectors
B6 = NEMA 4X with 1/2" Conduit Hubs
B7 = NEMA 4X with MS Connectors
BA = NEMA 4X with MS Connectors and Display
BC = NEMA 4X with 1/2" Conduit Hubs and Display

Approvals/Special Configuration

Blank = No Approval or special configuration
XXX = Factory assigned three-digit special code
– IS = FM Intrinsically Safe
Class I, Div. 1, Groups A, B, C & D
Available on enclosure option: – 1
CFP = CE per EN 61326
Increased Safety per EN 50019
EEx nC e IIC T5 G3
Available on enclosure option: – F

Accessories

Mating 10-Pin MS Connector: 15-93741-01 (enclosure option 1 only)

Programming Cable: 19-61348-104 (enclosure option 1 only)

Programming Cable: 19-61348-102 (remote enclosure PCB)

Programming Software CD: 09-67297-030

Note: Software can be downloaded from FTI's website at www.ftimeters.com

Specifications are for reference only and are subject to change without notice.

Local Representative:



8930 S. Beck Avenue, Ste 107, Tempe, Arizona 85284 USA
Tel: (480) 240-3400 • Fax: (480) 240-3401 • Toll Free: 1-800-528-4225
E-mail: ftimarket@ftimeters.com • Web: www.ftimeters.com

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