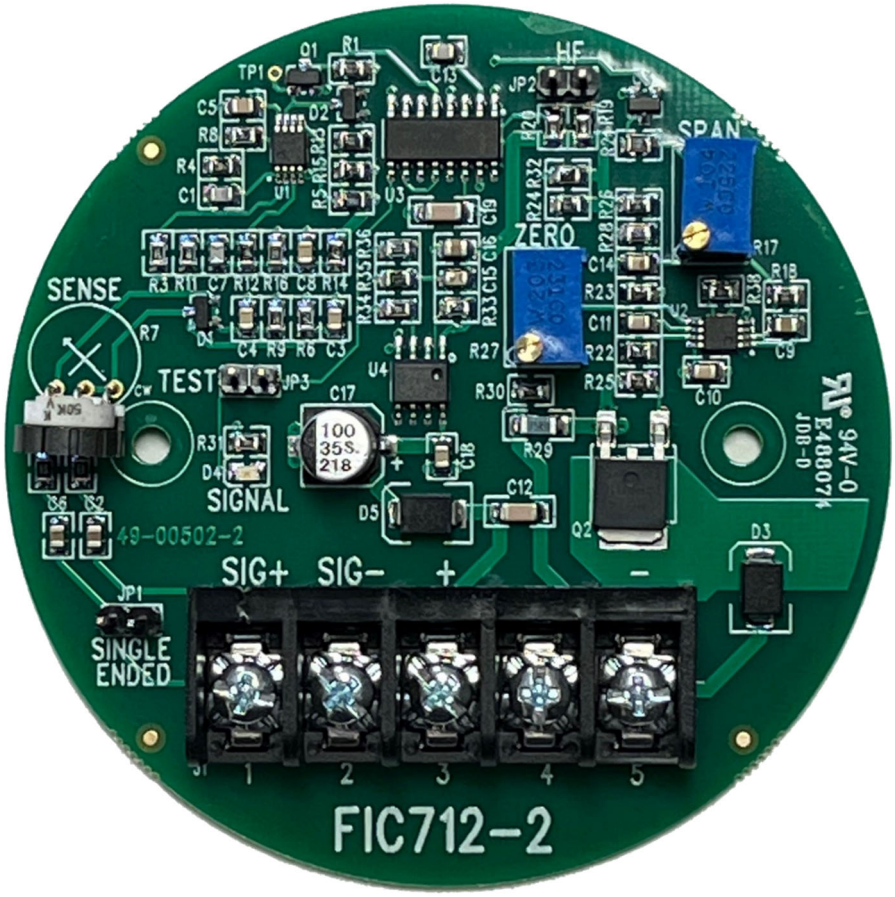
FIC712-2
Loop Powered 2 wire 4-20mA Transmitter

Installation and Operation Manual



Turbines, Inc.™

SPECIFICATIONS

Temperature:	Operating -40 to 85°C Storage -65 to 125°C
Input Voltage:	Minimum = 7 V + (20mA X RL) Maximum = 28 V + (4mA X RL) Protected against polarity reversal
Signal Input:	Frequency 0-10 KHz Amplitude 50 mV – 35 V sine or square wave Sensitivity field adjustable Impedance 50K
Analog Output	4mA @ 0 Hz, 20mA @ desired full-scale frequency Full scale range -- 100 Hz-10 KHz selectable Response time -- 95% of change in 1 second Linearity -- .3% F/S Tempco -- < 2% of reading over entire temperature range
Features:	Built in test Individual LED indicators for power and signal Mounts directly on flowmeter
Enclosure:	FM Approved, CSA Certified Class I Groups B, C, D Class II Groups E, F, G Weight 1.7 lbs.

The **FIC712-2** is a 2-wire loop powered analog transmitter designed to linearly convert a frequency input to an equivalent 4-20mA current output. When it incorporates with a turbine flowmeter a current representation proportional to flow is obtainable. Data transmission in a current format exhibits excellent noise immunity and the capability of long distance transmission.

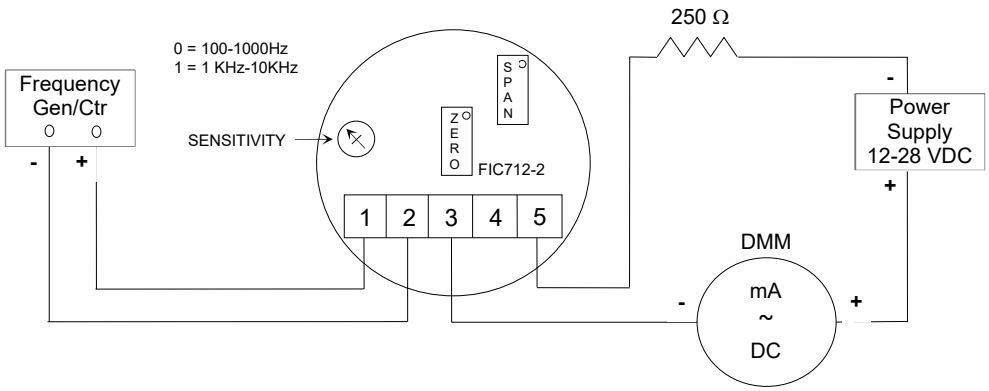
A full-scale frequency range of 100 Hz-1KHz or 1KHz-10KHz if **JP2** jumper is installed. The span adjustment establishes the frequency point at which a 20mA output is achieved. The sensitivity adjustment **R7** permits the **FIC712-2** to discriminate between a signal input and noise by increasing (CCW) or decreasing (CW) the input signal amplitude necessary to process a valid signal. The FIC712-2 can operate with a differential input configuration or single ended with **JP1** jumper installed. '**Test**' jumper **JP3,** when installed, illuminates **D4** if both loop voltage and input signal are present.

Installation of the **FIC712-2** requires only 2 wires because it is a true 2-wire transmitter: input power and signal output utilize the same wires.

BENCH TEST CALIBRATION PROCEDURE

Required Equipment: Power Supply 12-28v, Digital Multimeter (DMM), Frequency Generator, & Frequency Counter

Test Procedure:



A) Connect DMM positive lead to power supply positive, connect DMM negative lead to J1-3, set DMM function to mA DC

B) Connect power supply negative lead to 250 Ω resistor, connect other resistor leg to J1-5

C) Connect frequency generator positive & negative leads to J1-1,2; respectively. Set output to sinewave & amplitude to zero

D) Set JP2 for desired frequency range

E) Turn power supply & frequency generator 'ON', DMM should indicate approximately 4.00mA

F) Adjust '**ZERO**' (R27) for 4.00mA DMM indication (record data)

G) Set '**Sensitivity**' adjust (R7) fully clockwise

H) Adjust signal amplitude of frequency generator to 50mv & frequency to maximum desired point (full scale frequency) (record data)

I) Adjust '**SPAN**' (R17) for 20.00mA DMM indication (record data)

J) Reduce signal amplitude of frequency generator to zero, adjust '**ZERO**' (R27) for 4.00mA DMM indication if necessary

K) Adjust signal amplitude of frequency generator to 50mv, adjust '**SPAN**' (R17) for 20.00mA DMM indication if necessary

L) Adjust frequency of frequency generator to exactly 50% of maximum frequency point in step H, DMM should indicate 12.00mA ± .06. Repeat for 25% & 75% full scale frequencies (record data)

To check linearity @ any frequency point, incorporate the following formula:

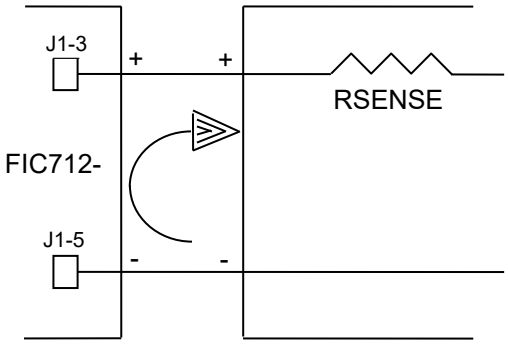
$$\mathbf{(F/F_{max}\ X\ 16) + 4 = mA}$$

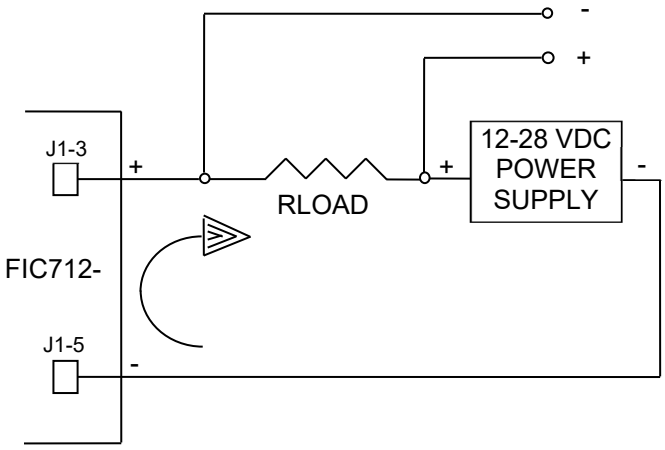
Where F = Flowrate frequency in Hz
F_{max} = Frequency in Hz at which 20mA is set

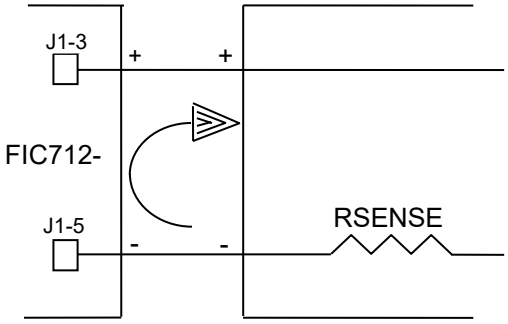
Ex: Assume maximum frequency point = 2000 Hz (20.00mA) Check for linearity @ 750 Hz point

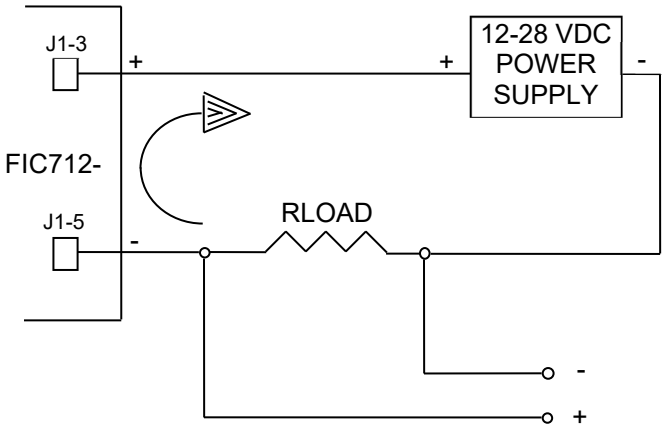
750/2000 = .375
16 X .375 = 6
6 + 4 = 10; DMM should indicate 10.00mA @ 750 Hz input

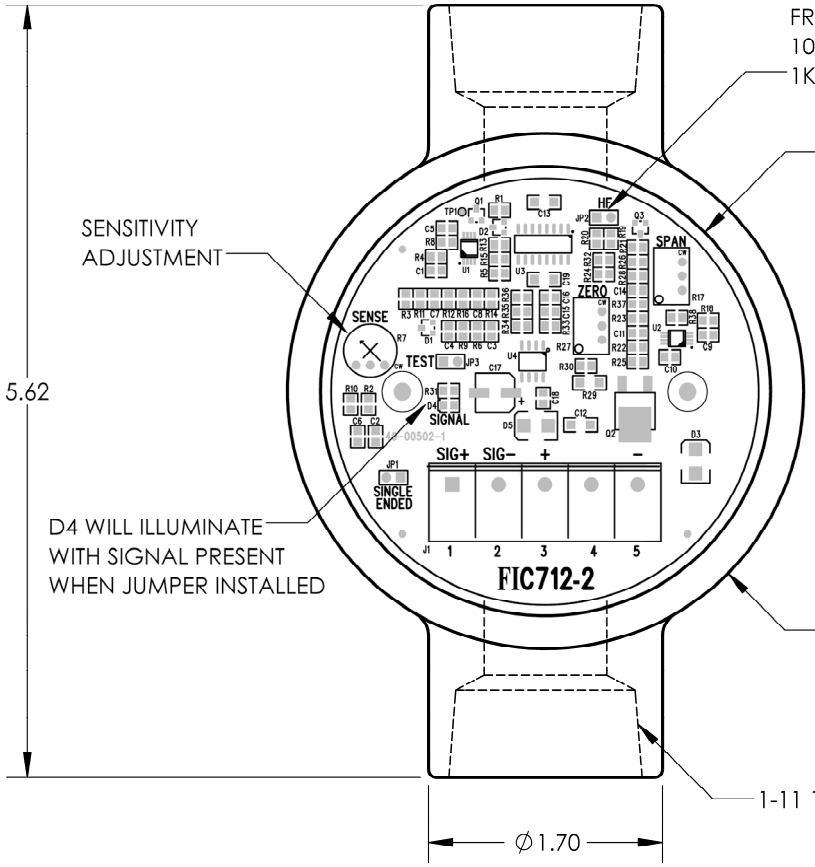
TYPICAL LOOP CONFIGURATIONS











TERMINAL LOCATION

1 SIGNAL IN +
2 SIGNAL IN -
3 LOOP IN +
4 N/C
5 LOOP IN -

NOTE: DIMENSIONS ARE IN INCHES

REV.	DATE	ECN	APPROVAL

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL±1/64"
ANGULAR: ±1/2°
TWO PLACE DECIMAL ±.010
THREE PLACE DECIMAL ±.005

MATERIAL

FINISH

DO NOT SCALE DRAWING

	NAME	DATE
DRAWN	EDWARD HUEY	11/11/22
CHECKED		
ENG APPR.		

TITLE

FIC712-2 LOOP POWERED
4-20mA TRANSMITTER

Turbines, Inc.™

SIZE	DWG. NO.	REV.	LEV.
A	FIC712-2		
SCALE:1:1.2	WEIGHT:	SHEET 1 OF 1	