EBTRON®
Thermal Dispersion Airflow Measurement

Model **STA102**
Quick Installation Guide

Silver Series Thermal Dispersion Airflow Measurement Technology

Advantage
Silver Series by Ebtron

Quick Installation Guide

STA102

Analog Output Transmitter

Document: IG_STA102_R1C

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SILVER SERIES
INSTALLATION GUIDE

IG_STA102_R1C

Part Number: 930-0055

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LIST OF EFFECTIVE AND CHANGED PAGES

Insert latest changed pages (in bold text); remove and dispose of superseded pages.
Total number of pages in this manual is **10.**

Page No	Revision *	Description of Change	Date
1	**R1C**	**Changed document revision to R1C**	**01/08/2010**
2	**R1C**	**Updated List of Effective pages for R1C changes**	**01/08/2010**
3 through 7	**R1C**	**Revised for consistency among Installation Guides**	**01/08/2010**
8	**R1C**	**Reissued as R1C/no change**	**01/08/2010**
9	**R1C**	**Added wiring diagram**	**01/08/2010**
10	**R1C**	**Added rear cover sheet**	**01/08/2010**
4, 6	R1B	Revised fuse part numbers	08/24/2009
1 through 8	R1A	Initial Document Release	03/24/2009

***** R1A indicates an original page without change

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OVERVIEW

This document provides only the instructions necessary to install the STA102 Transmitter. Transmitter installation consists of mounting the transmitter, installing output/network cables, connecting the sensor probe and preparing the transmitter for operation. For complete setup and operating instructions refer to the STx102 Installation, Operation and Maintenance technical manual, TM_STx102 under separate cover.
Observe the following precautions during installation:

CAUTION

In locations exposed to direct rain and/or snow, the transmitter must be enclosed in a NEMA4 enclosure.

Leave at least 7" (177.8 mm) above, and 3" (76.2 mm) to each side and bottom, of unobstructed space around the transmitter to allow for heat dissipation and cover removal.

Locate the transmitter in a location that can be reached by all connecting cables from the sensor probes.

Do not drill into the transmitter enclosure since metal shavings could damage the electronics.

STA102 TRANSMITTER INSTALLATION

The STA102 transmitter is designed for use in an environment between -20° F to 120° F *(-28.8° C to 48.8° C)* where it will not be exposed to rain or snow. The transmitter shall be mounted upright in a field accessible location such that all power, network and sensor probe cables can reach the connections on the transmitter enclosure. The enclosure is designed to accept 3/4 in. *(19.0 mm)* conduit fittings for signal and power wiring at the top left and right sides as shown in Figure 1. Mount the transmitter using suitable hardware at the four 0.188 in (4.76 mm) diameter holes on the left and right mounting tabs.

Mechanical Dimensions

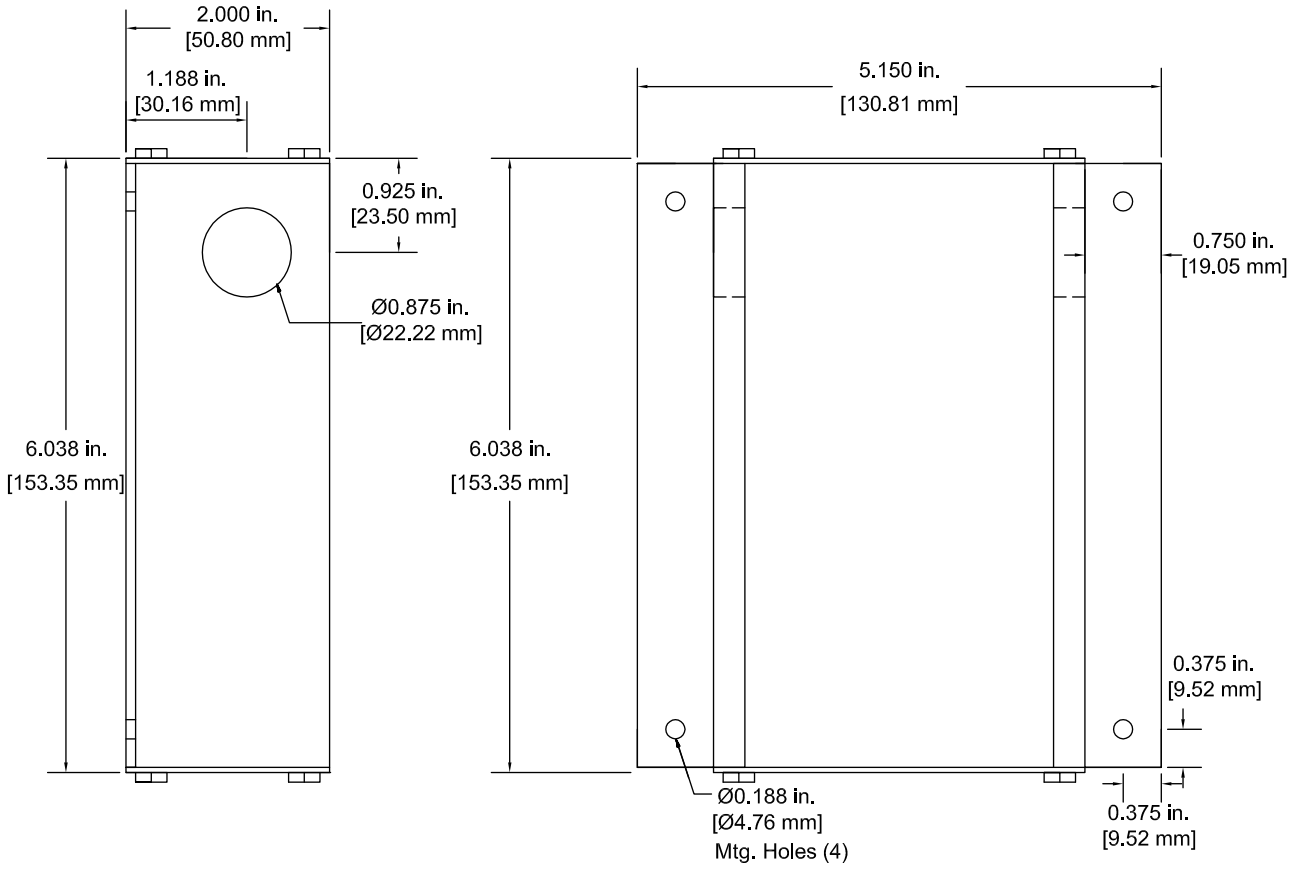

Figure 1. STA102 Transmitter Mechanical Detail Drawing

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STA102 POWER TRANSFORMER SELECTION

The 24 VAC transformer selected must be capable of supplying 8 VA. The operating supply voltage (with transmitter powered "ON" and with sensor probes connected) should not be less than 22.8 VAC or greater than 26.4 VAC.

STA102 POWER CONNECTIONS

Slide the cover plate up and off of the transmitter enclosure, and ensure that the 24VAC power source is deactivated before making the 24 VAC power connections to the transmitter.

Connect 24 VAC power to the large, two position power input terminals labeled "POWER - 24 VAC IN - L2/L1" on the upper right hand side of the main circuit board as shown in Figure 2. It is not necessary to provide an isolated (secondary not grounded) power source since the output signals are galvanically isolated from the power supply.

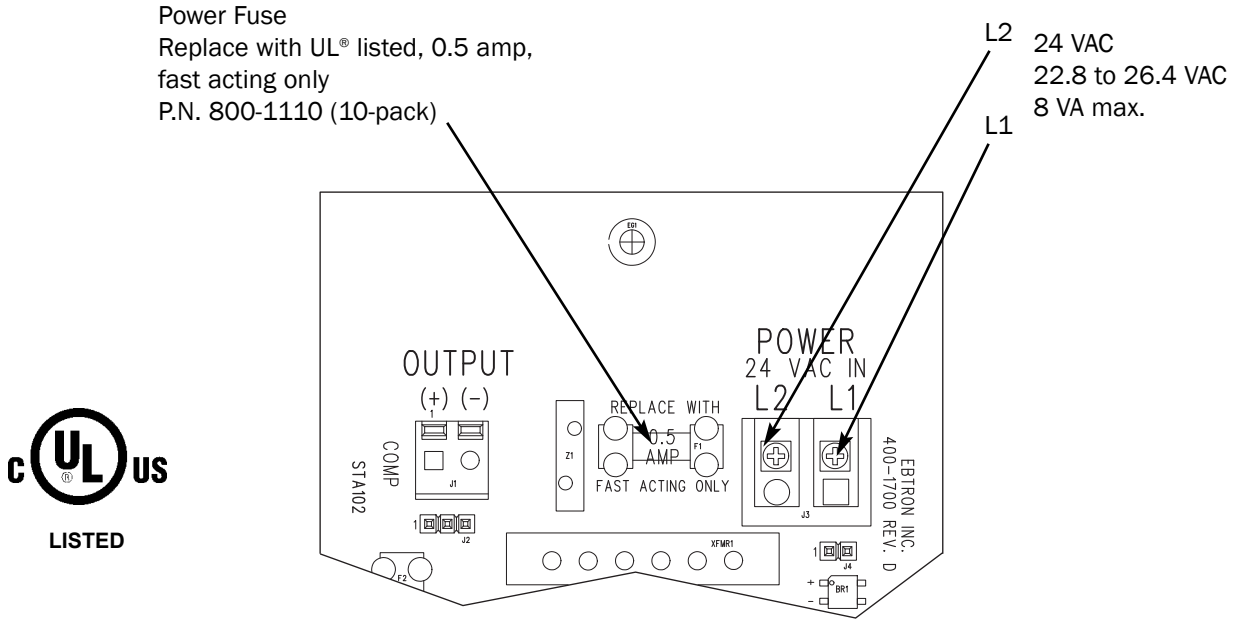

Figure 2. STA102 Power Connections

Multiple STA102 transmitters wired to a single transformer must be wired "in-phase" (L1 to L1, L2 to L2).

Sensor probe must be connected to the transmitter before applying 24VAC power in order to properly "flash" sensor calibration data to the transmitter.

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CONNECTING SENSOR PROBE TO THE TRANSMITTER

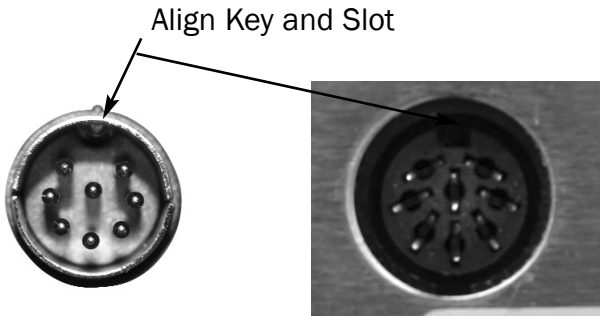
After mounting the sensor probe and transmitter, connect the sensor probe cable plug to the circular receptacle located at the bottom of the STA102 transmitter enclosure. STA102 transmitter accepts SP1, ST1 , or SB1 sensors. The illustration below shows transmitter and sensor probe connector details.

Provide a "drip loop" at the transmitter if there will be the potential for water runoff or condensation along the sensor probe cable(s).

Sensor probe cable plugs are "keyed" as shown in the connector detail below. Line up plug with receptacle and push straight on to receptacle. DO NOT TWIST. Squeeze cable plug "ribs" towards receptacle when removing. Forcing the cable plug in or out of the receptacle will damage the connectors and void warranty.

TRANSMITTER RECEPTACLE VIEW

CONNECTING CABLE PROBES TO TRANSMITTER



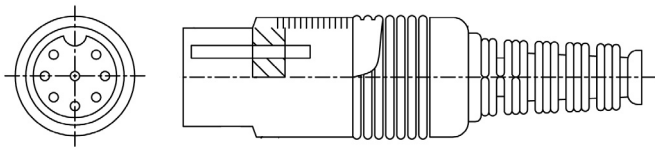


Figure 3. STA102 Transmitter and Probe Connector Detail

STA102 TRANSMITTER SET UP

The STA102 analog transmitter provides a single 10-bit (1024 discrete states) linear analog output with overvoltage and overcurrent protection. The output is field selectable as either 0-10VDC or 4-20mA, and is galvanically isolated from the main power supply to permit simple integration to virtually all building automation systems.

To wire the output signal, slide the cover plate up and off of the enclosure. Ensure that the 24 VAC power source is deactivated. Connect signal wires for airflow rate at the two position output terminal labeled "OUTPUT" on the upper left hand side of the main circuit board as indicated below.

When configured for a 4-20mA output, the STA102 is a "4-wire" device. The host controls must not provide any excitation voltage to the output of the STA102.

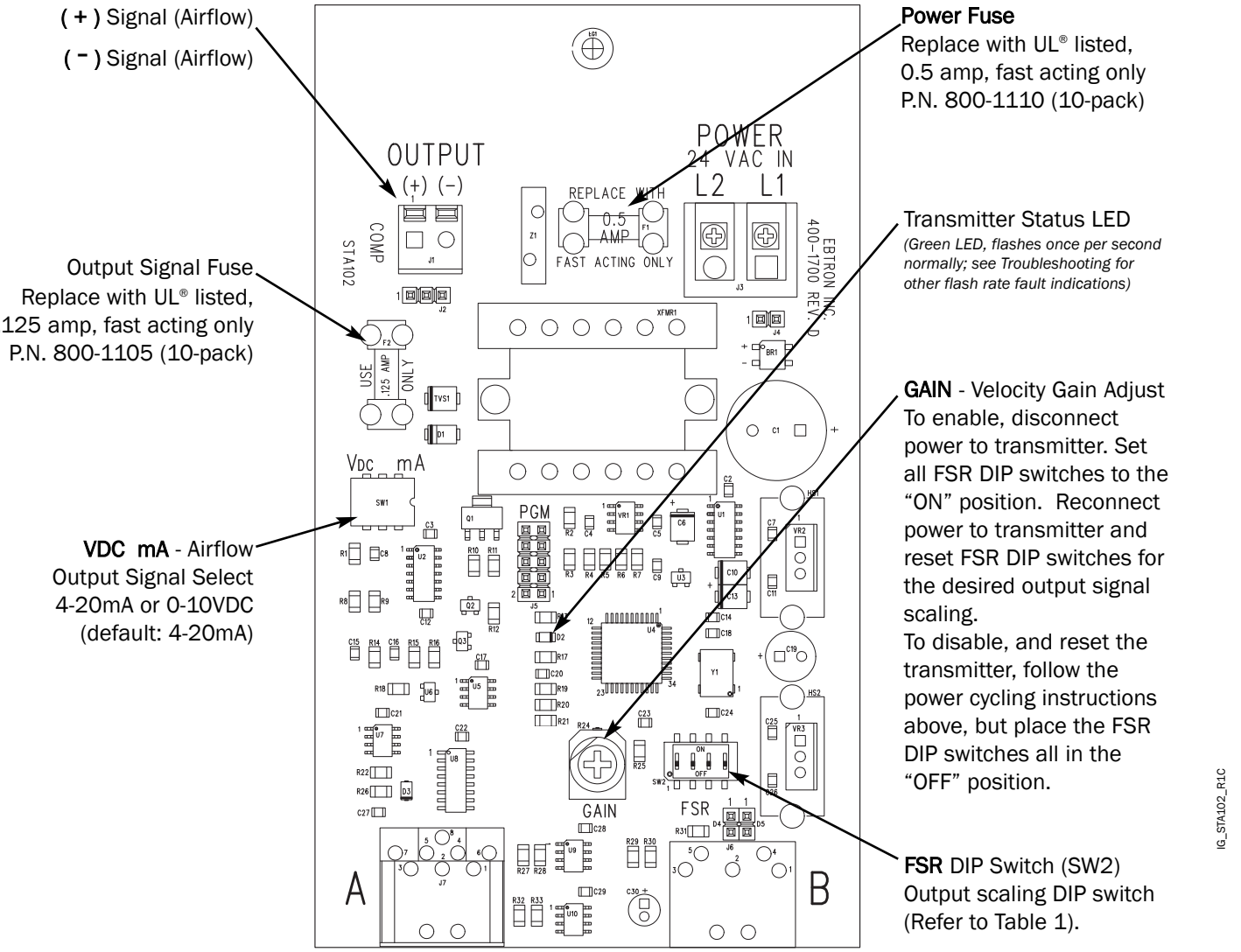


Figure 4. STA102 Analog Circuit Board Detail

STA102 - Analog Output Signal Selection, 0-10VDC / 4-20mA

The analog output signal at OUT1 can be set for 4-20mA current (mA) or 0-10VDC voltage (VDC) output via VDC/ MA DIP switch SW1 as shown in Figure 4. The analog output at OUT1 is shipped from the factory set for 4-20mA. If the 0-10VDC output is desired, simply move the output selector switch (VDC/ MA) to the VDC position.

STA102 - Converting Analog Output Signals to Airflow and Temperature

The accuracy of the STA102 is "percent of reading", so there is no advantage in reconfiguring the default output scales listed inside of the transmitter cover. However, if necessary, factory default settings can be easily reconfigured in the field by setting the FSR DIP Switch shown in Figure 4 and Table 1. For additional detail, refer to Technical Manual TM_STx102, section titled CHANGING FACTORY DEFAULT SETTINGS.

The equivalent volumetric flow full scale reading can easily be determined by multiplying the full scale reading by the free area where the airflow measuring station is located (free area x 1000 for S.I. scaling when the area is calculated in square meters). For -P and -T probes, the free area is printed on the hang-tag of each sensor probe. For -B sensor probes, the free area must be determined after the units are installed. Refer to Technical Manual TM_STx102 for specific conversion factors for analog voltage or current options for each sensor type.

STA102 - Sending a Test Output Signal to the Host Control System

Test output signals of 0 and 50% of the full scale output (0 to 10VDC or 4 to 20mA) can be provided by the STA102 transmitter to verify proper conversion of the output signals from the STA102 transmitter at the host control system.

To set a fixed "zero scale" output signal for airflow (which is 4mA for 4-20mA, and 0VDC for 0-10VDC), first record the FSR DIP switch positions, and then set all FSR DIP switches to the "OFF" position while the transmitter is operating. When the test output signal is no longer required, simply return the FSR DIP switches to the previous scaling position. (Refer to Table 1 for scaling).

To set a fixed 50% (half scale) output signal for airflow and temperature (which is 12mA for 4-20mA, and 5 VDC for 0-10VDC), first record the FSR DIP switch positions, and then set all FSR DIP switches to the "ON" position while the transmitter is operating. When the test output signal is no longer required, simply return the FSR DIP switches to the previous scaling position. (Refer to Table 1 for scaling).

Table 1. FSR DIP Switch Settings for Analog output Scaling (with Default Values)

SW2				STA102-P	STA102-T	STA102-B
DIP Switch Position				Output 1	Output 1	Output 1
1	2	3	4			
off	off	off	off	Output = null	Output = null	Output = null
off	off	off	on	0-500 FPM	0-500 FPM	+/- 0.05 in.w.g.
				(0-2.54 m/s)	*(0-2.54 m/s)*	*(+/- 12.45 Pa)*
off	off	on	off	0-500 FPM	0-500 FPM	+/- 0.15 in.w.g.
				(0-2.54 m/s)	*(0-2.54 m/s)*	*(+/- 37.5 Pa)*
off	off	on	on	0-1,000 FPM	0-1,000 FPM	+/- 0.25 in.w.g.
				(0-5.08 m/s)	*(0-5.08 m/s)*	*(+/- 62.25 Pa)*
off	on	off	off	0-1,000 FPM	0-1,000 FPM	*+/- 0.50 in.w.g.*
				(0-5.08 m/s)	*(0-5.08 m/s)*	*(+/- 124.5 Pa)*
off	on	off	on	0-1,500 FPM	0-1,500 FPM	0-250 FPM
				(0-7.62 m/s)	*(0-7.62 m/s)*	*(0-1.27 m/s)*
off	on	on	off	0-1,500 FPM	0-1,500 FPM	0-500 FPM
				(0-7.62 m/s)	*(0-7.62 m/s)*	*(0-2.54 m/s)*
off	on	on	on	0-2,000 FPM	0-2,000 FPM	0-1,000 FPM
				(0-10.16 m/s)	*(0-10.16 m/s)*	*(0-5.08 m/s)*
on	off	off	off	0-2,000 FPM	0-2,000 FPM	0-2,000 FPM
				(0-10.16 m/s)	*(0-10.16 m/s)*	*(0-10.16 m/s)*
on	off	off	on	0-2,500 FPM	0-2,500 FPM	0-3,000 FPM
				(0-12.7 m/s)	*(0-12.7 m/s)*	*(0-15.24 m/s)*
on	off	on	off	0-2,500 FPM	0-2,500 FPM	+/- 250 FPM
				(0-12.7 m/s)	*(0-12.7 m/s)*	*(+/- 1.27 m/s)*
on	off	on	on	0-3,000 FPM	0-3,000 FPM	+/- 500 FPM
				(0-15.24 m/s)	*(0-15.24 m/s)*	*(+/- 2.54 m/s)*
on	on	off	off	0-3,000 FPM	0-3,000 FPM	+/- 1,000 FPM
				(0-15.24 m/s)	*(0-15.24 m/s)*	*(0-5.08 m/s)*
on	on	off	on	0-5,000 FPM	0-5,000 FPM	+/- 2,000 FPM
				(0-25.4 m/s)	*(0-25.4 m/s)*	*(+/- 10.16 m/s)*
on	***on***	***on***	***off***	**0-5,000 FPM**	**0-5,000 FPM**	**+/- 3,000 FPM**
				(0-25.4 m/s)	***(0-25.4 m/s)***	***(+/- 15.24 m/s)***
on	on	on	on	Output = 1/2 F.S.	Output = 1/2 F.S.	Output = 1/2 F.S.

Underlined items indicate Factory Default Values

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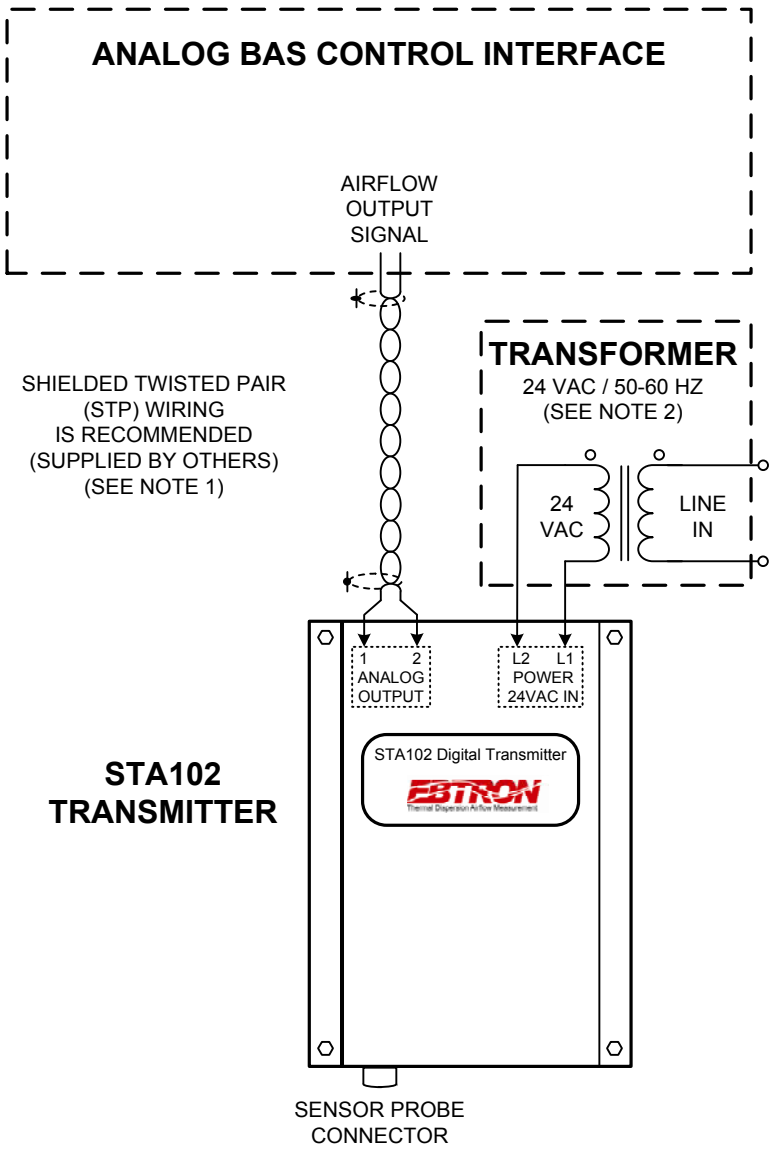
APPENDIX A -
STA102 WIRING DIAGRAM



NOTES:
1: CONNECT OUTPUT SIGNAL CABLE DRAINS TO EARTH GROUND AT ONE END OF CABLE ONLY.

2. ON MULTIPLE STA102 TRANSMITTER INSTALLATIONS WITH A COMMON 24VAC SOURCE, ENSURE THAT 24 VAC POWER TO ALL TRANSMITTERS IS WIRED IN-PHASE TO THE SAME TERMINALS (e.g.: L1 to L1, L2 to L2).

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