

Advantage II

Gold Series by Ebtron

GOLD SERIES
INSTALLATION GUIDE

Quick Installation Guide

GTA116

Analog Output Transmitter

Document: IG_GTA116_R1B



IG_GTA116_R1B



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Insert latest changed pages (in bold text); remove and dispose of superseded pages.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, 2	R1B	Updated document revision and List of Effective Pages	02/10/2010
3 through 8	R1B	Added Overview, LCD Display Notifications and edited for consistency	02/10/2010
9, 10	R1B	Added Wiring Diagram and rear cover	02/10/2010
1 through 8	R1A	Initial Document Release	02/25/2009

Table of Contents

OVERVIEW3
 GTA116 TRANSMITTER INSTALLATION3
 GTA116 Power Transformer Selection4
 GTA116 POWER CONNECTIONS4
 CONNECTING SENSOR PROBES TO THE TRANSMITTER5
 GTA116 TRANSMITTER SET UP6
 GTA116 Alarm Output Option Feature7
 GTA116 - Analog Output Signal Selection, 0-5VDC / 0-10VDC / 4-20mA7
 GTA116 - Analog Output Scaling7
 GTA116 - Converting Analog Output Signals to Airflow and Temperature7
 GTA116 - Sending a Test Output Signal to the Host Control System7
 LCD Display Notifications7
 Last LCD Character Shown in Lower Case (Probe Malfunction)7
 All LCD Characters Shown in Lower Case (Field Cal Wizard Engaged)9
 LCD Blinks ** LOW ALARM **, ** HIGH ALARM ** or ** TRBL ALARM**9
 APPENDIX A - GTA116 WIRING DIAGRAM9

List of Figures

Figure 1. GTA116 Transmitter Mechanical Detail Drawing3
 Figure 2. GTA116 Power Connections4
 Figure 3. GTA116 Type A and Type B Transmitter Detail5
 Figure 4. GTA116 Connector Detail5
 Figure 5. GTA116 Analog Transmitter Interior Detail6

List of Tables

Table 1. GTA116 Power Transformer Selection Guide4
 Table 2. GTA116 Converting Analog to Airflow/Temperature8

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OVERVIEW

This document provides only the instructions necessary to install the GTA116 Transmitter. Transmitter installation consists of mounting the transmitter, installing output/network cables, connecting the sensor probes cables and preparing the transmitter for operation. For complete setup and operating instructions refer to the GTx116 Installation, Operation and Maintenance technical manual, TM_GTx116 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 10 in. (254.0 mm) above, and 2 in. (50.8 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.

GTA116 TRANSMITTER INSTALLATION

The GTA116 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

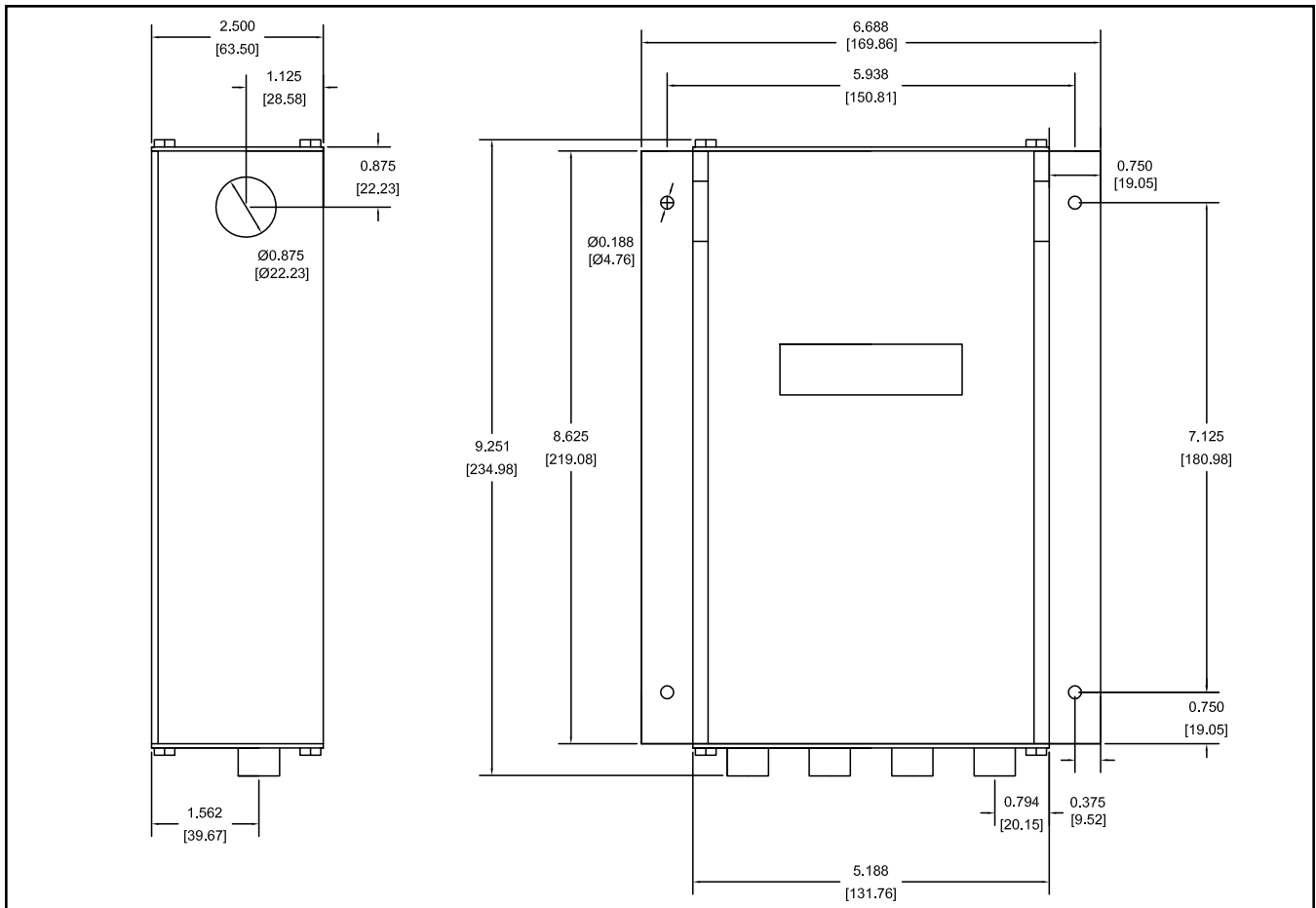


Figure 1. GTA116 Transmitter Mechanical Detail Drawing

GTA116 POWER TRANSFORMER SELECTION

Select a 24 VAC transformer based on the maximum power requirements indicated on the transmitter label (20 VA) or from the table below. The operating supply voltage (transmitter power “ON” with all sensor probes connected) should not be less than 22.8 VAC or greater than 26.4 VAC.

Table 1. GTA116 Power Transformer Selection Guide

Total Sensors	Minimum VA Req.	Total Sensors	Minimum VA Req.	Total Sensors	Minimum VA Req.	Total Sensors	Minimum VA Req.
1	12	5	14	9	17	13	19
2	13	6	15	10	17	14	19
3	13	7	15	11	18	15	20
4	14	8	16	12	18	16	20

GTA116 POWER CONNECTIONS

Slide the cover plate up and off of the transmitter enclosure, and ensure that the power switch is in the “OFF” position before connecting the 24 VAC power source.

Connect 24 VAC power to the large, two position power input terminal labeled “POWER” on the upper right hand side of the main circuit board as shown below. Since the output signals are isolated from the power supply, it is not necessary to provide an isolated (secondary not grounded) power source.



Multiple GTx116 transmitters wired to a single transformer must be wired “in-phase” (L1 to L1, L2 to L2).



Sensor probes must be connected to the transmitter before turning the power switch to the “on” position to properly “flash” sensor calibration data to the transmitter.

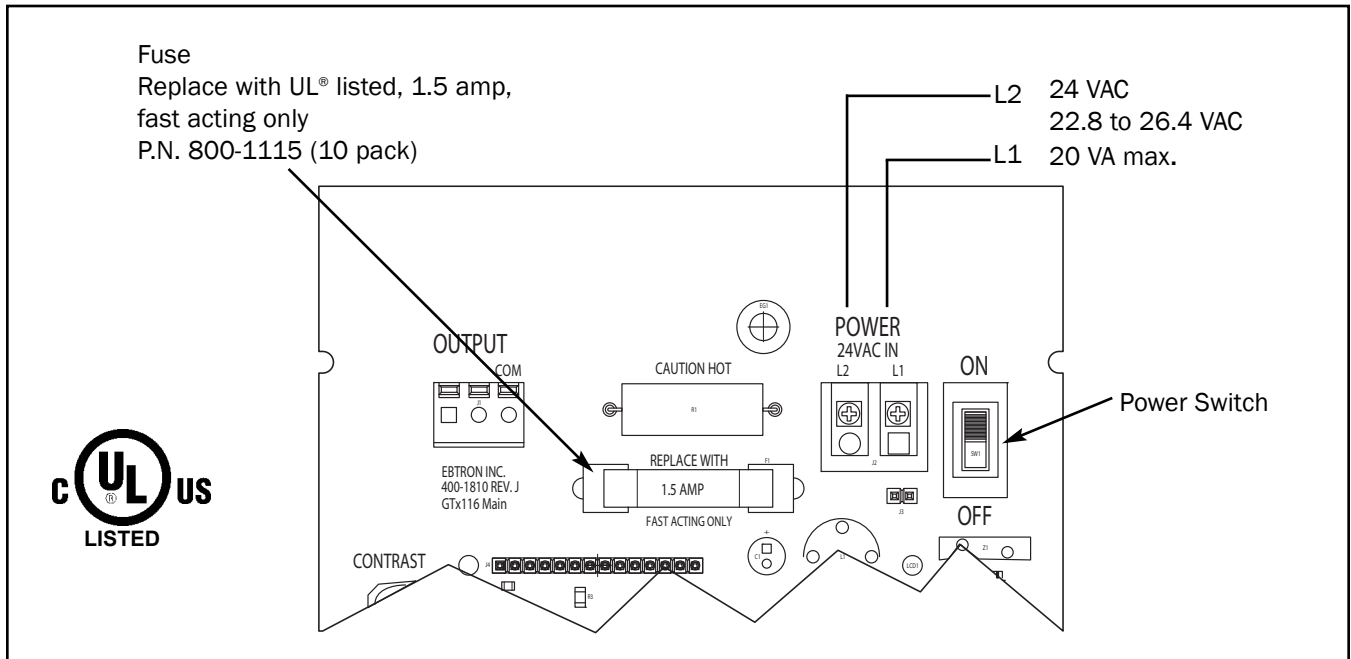


Figure 2. GTA116 Power Connections

CONNECTING SENSOR PROBES TO THE TRANSMITTER

After mounting the sensor probes and transmitter, connect each of the sensor probe cable plugs to the circular receptacles located at the bottom of the GTA116 transmitter enclosure. Probes are “Plug and Play” and do not have to be connected to a specific receptacle on the transmitter (unless traverse data is desired - see note below). Transmitters can accept GP1, GF1 or GB1 sensors. Mixing sensor types on a single transmitter is not permitted. Match probes to transmitter by type (A or B) as indicated on the tags on the transmitter and sensor probes as shown below.



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.



If traverse data is desired, the probes should be installed and connected to the transmitter using the mounting convention specified in the separate GP1 sensor probe manual. Proper installation simplifies sensor location decoding during data analysis.

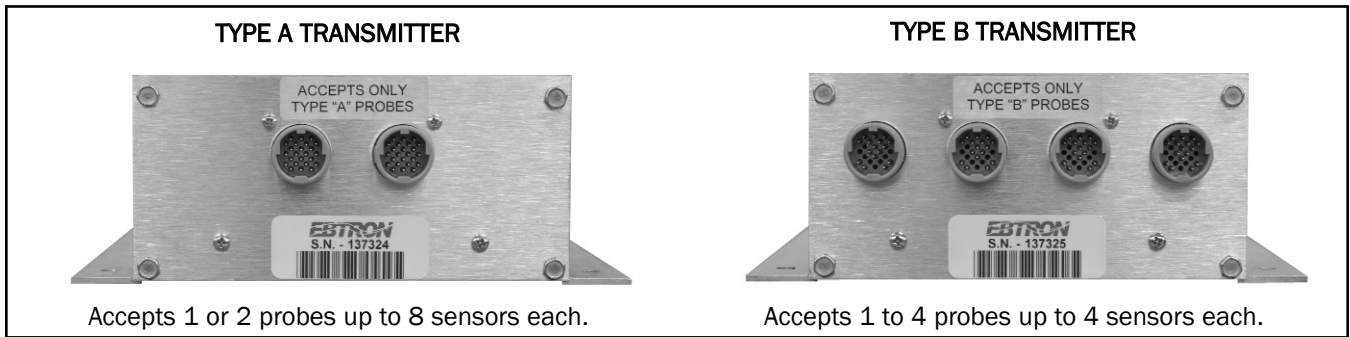


Figure 3. GTA116 Type A and Type B Transmitter Detail

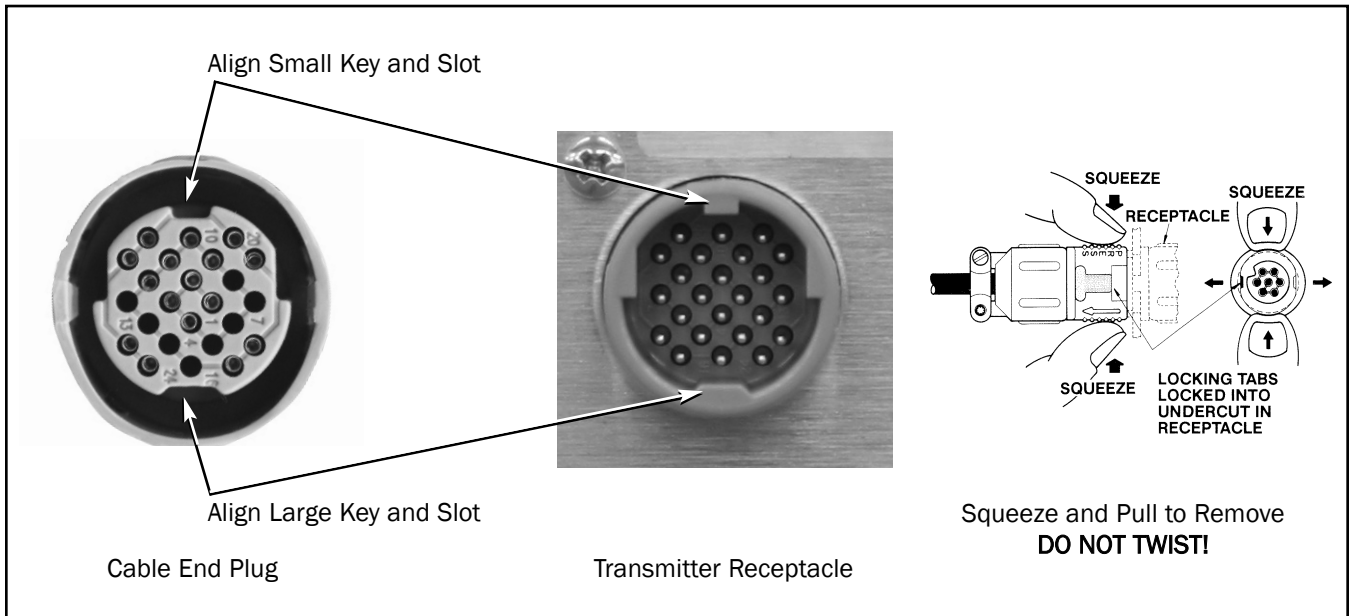


Figure 4. GTA116 Connector Detail

IG_GTA116_R1B

GTA116 TRANSMITTER SET UP

The GTA116 analog output is available at the upper left side of the main circuit board as shown in Figure 5. Independent linear analog outputs are available for airflow at OUT1, and temperature (or Alarm) at OUT2; each with over voltage and over current protection. Airflow and temperature outputs can be configured for voltage output (0-5 VDC / 0-10VDC) or current output (4-20 mA). Outputs are galvanically and optically isolated from the main power supply to permit simple integration with virtually all building automation systems. Refer to the proceeding paragraph titled GTA116 Alarm Output Option Features for information on the Alarm output.

To wire the output signal, slide the cover plate up and off of the enclosure. Ensure that the power switch is in the "OFF" position. Connect signal wires for airflow rate and temperature to the three position output terminal labeled "OUTPUT" at the upper left hand side of the main circuit board as indicated in Figure 5. Airflow output is at terminal 1, temperature (or alarm) output is at terminal 2 and common connections are made at the COM terminal. For additional detail, refer to the GTA116 Wiring Diagram of Appendix A.



When configured for a 4-20mA output, the GTA116 is a "4-wire" device. The host controls should not provide any excitation voltage to the output of the GTA116.

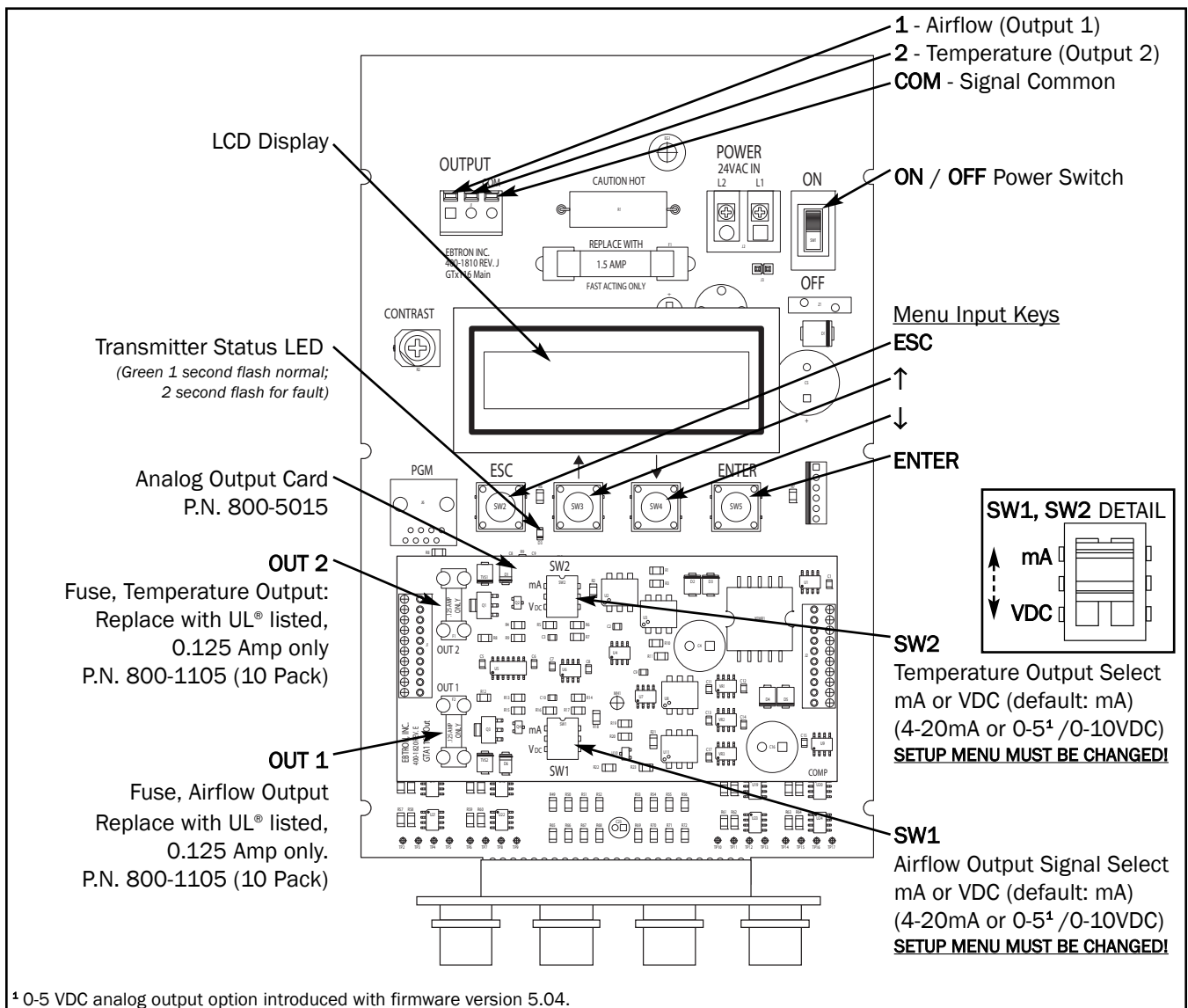


Figure 5. GTA116 Analog Transmitter Interior Detail

GTA116 Alarm Output Option Feature

The GTA116 transmitter is equipped with a programmable alarm feature that can be programmed to produce an alarm output at OUT2 for a Hi or Low limit setpoint with hysteresis (for operating range) for airflow or pressure. The alarm can also be set to monitor transmitter and sensor probe status to provide an alarm in the event of a fault condition. The alarm output can be programmed as active high or active low at the analog output. The Alarm output is disabled by default at the factory to permit temperature output at OUT2. Set up of the Alarm output option features is detailed in the GTx116 Technical Manual Set Up Menu (under separate cover).

GTA116 - Analog Output Signal Selection, 0-5VDC / 0-10VDC / 4-20mA

The analog outputs signal type at OUT1 (airflow) and OUT2 (temperature) can be set independently for current (mA) or voltage (VDC) output via switches SW1/SW2 (Figure 5) **and** by selecting 4-20mA, 0-5VDC or 0-10VDC ranges in Setup menu options *OUT1= / *OUT2= settings. When changing Setup menu options *OUT1= or *OUT2=, the LCD display provides a user prompt (“**SET SW1/SW2 ON BOARD**”) to remind user to set SW1 and/or SW2 switches to the proper position. The transmitter is shipped from the factory with SW1/SW2 and Setup menu options *OUT1= and *OUT2= all set for 4-20mA.



To change the analog output signal type at OUT1 or OUT2, the corresponding switch (SW1/SW2) settings **AND** the Setup menu *OUT1= / *OUT2= settings must **ALL** agree. Refer to detail on facing page for SW1/SW2 and separate Technical Manual, TM_GTX116 Figures 15 and 16 for Setup menu selections.

GTA116 - Analog Output Scaling

The accuracy of the GTA116 is “percent of reading”, so there is no advantage to reconfiguring the default output scales listed inside of the transmitter cover. However, if necessary, factory default settings can be easily reconfigured in the field. For details, refer to Technical Manual TM_GTx116, section titled CHANGING FACTORY DEFAULT SETTINGS.

GTA116 - Converting Analog Output Signals to Airflow and Temperature

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 units, the free area is electronically programmed into the probe, and is printed on the hang-tag of each sensor probe. For -F and -B units, the free area must be determined after the units are installed. Table 2 lists specific conversion factors for analog voltage or current options for each sensor type.

GTA116 - Sending a Test Output Signal to the Host Control System

A test output signal between 0 and 100% of the full scale output (4 to 20 mA or 0-5⁴VDC/0-10VDC) can be provided by the GTA116 transmitter to verify proper conversion of the output signals from the GTA116 transmitter at the host control system. To set a fixed output signal for airflow and temperature, simultaneously press and release the “ENTER” and “ESC” buttons within 10 seconds of power up. Use the “DOWN” arrow button until “*TESTOUT=0%” is displayed. Press the “ENTER” button and use the “UP” and “DOWN” arrow buttons to select an output between 0 and 100% of the full scale. Press the “ENTER” button to set the output percentage. Press the “ESC” button when verification is complete to return to the normal operating mode.

LCD Display Notifications

Following a brief initialization at power up, the LCD display automatically displays airflow and temperature as all upper case (caps) characters. The display provides additional information on system status and alarm conditions as follows:

Last LCD Character Shown in Lower Case (Probe Malfunction)

If the last character of the flow rate units on the LCD display is shown in lower case (for example **FPm** or **CFm**), this indicates an improper or malfunctioning probe is connected to the transmitter. (Refer to Tables 19 and 20 of technical manual TM_GTx116 under separate cover for additional troubleshooting detail).

Table 2. GTA116 Converting Analog to Airflow/Temperature

When OUTPUT 1 is Configured as Linear Airflow (FPM, MPS):

TO CONVERT TO	ANALOG OUTPUT SCALING AND TYPE		
	0-10 VDC	0-5 VDC ¹	4-20 mA
Unidirectional Airflow (FPM, MPS)	Output Voltage/10 x FS1	Output Voltage/5 x FS1	(Output Current-4)/16 x FS1
Unidirectional Airflow (CFM)	Area (SQF) x Output/10 x FS1	Area (SQF) x Output/5 x FS1	Area (SQF) x (Output - 4)/16 x FS1
Unidirectional Airflow (LPS)	Area (SQM) x Output/10 x FS1 x 1000	Area (SQM) x Output/5 x FS1 x 1000	Area (SQM) x (Output - 4)/16 x FS1 x 1000
Bidirectional Airflow (FPM,MPS) (-B only)	(Output Voltage - 5)/5 x FS1	(Output Voltage -2.5)/2.5 x FS1	(Output Current - 12)/8 x FS1
Bidirectional Airflow (CFM) (-B only)	$K_v \times (\text{Output Voltage} - 5)/5 \times \text{FS1}$ <i>K is determined by field measurement or from K tables in Bleed Sensor Technical Manual, TM_GB1.</i>	$K_v \times (\text{Output Voltage} - 2.5)/2.5 \times \text{FS1}$ <i>K is determined by field measurement or from K tables in Bleed Sensor Technical Manual, TM_GB1.</i>	$K_v \times (\text{Output Current} - 12)/8 \times \text{FS1}$ <i>K is determined by field measurement or from K tables in Bleed Sensor Technical Manual, TM_GB1.</i>
Bidirectional Airflow (LPS) (-B only)			

When OUTPUT 1 is Configured as Volumetric Airflow (CFM, LPS):

TO CONVERT TO	ANALOG OUTPUT SCALING AND TYPE		
	0-10 VDC	0-5 VDC ¹	4-20 mA
Unidirectional Airflow (CFM, LPS)	Output Voltage/10 x FS1	Output Voltage/5 x FS1	(Output Current - 4)/16 x FS1
Bidirectional Airflow (CFM, LPS) (-B only)	(Output Voltage - 5)/5 x FS1	(Output Voltage -2.5)/2.5 x FS1	(Output Current - 12)/8 x FS1

When OUTPUT 1 is Configured as Pressure (iWC, PA):

TO CONVERT TO	ANALOG OUTPUT SCALING AND TYPE		
	0-10 VDC	0-5 VDC ¹	4-20 mA
Unidirectional Pressure (iWC, PA)	Output Voltage/10 x FS1	Output Voltage/5 x FS1	(Output Current - 4)/16 x FS1
Bidirectional Pressure (iWC, PA)	(Output Voltage - 5)/5 x FS1	(Output Voltage -2.5)/2.5 x FS1	(Output Current - 12)/8 x FS1

When OUTPUT 2 is Configured as Temperature (°F, °C):

TO CONVERT TO	ANALOG OUTPUT SCALING AND TYPE		
	0-10 VDC	0-5 VDC ¹	4-20 mA
Temp (°F, °C)	Output Voltage/10 x (FS2 - MS2) + MS2	Output Voltage/5 x (FS2 - MS2) + MS2	(Output Current - 4)/16 x (FS2 - MS2) + MS2

NOTES:

¹ 0-5 VDC analog output option introduced in firmware version 5.04 and forward.

FS1 is OUTPUT1 full scale analog output value from SETUP MENU.

FS2 is OUTPUT2 full scale analog output value from SETUP MENU.

MS2 is OUTPUT2 minimum scale analog output value from SETUP MENU.

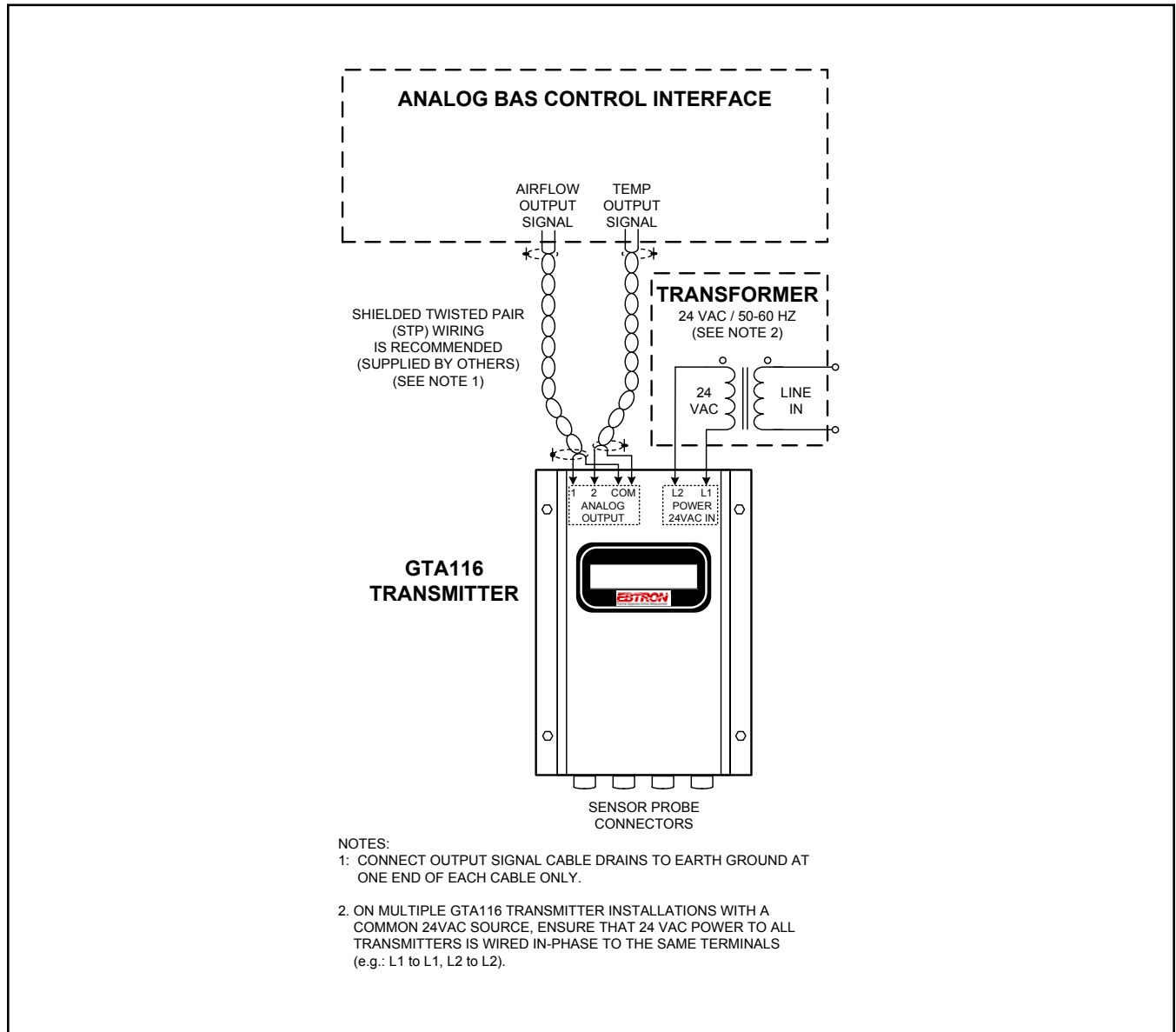
All LCD Characters Shown in Lower Case (Field Cal Wizard Engaged)

If all characters of the flow rate units on the LCD display are in lower case (for example fpm or cfm), this indicates that the transmitter is operating in the Field Calibration Wizard mode (see FIELD ADJUSTMENTS - Field Calibration Wizard section contained in technical manual TM_GTx116 under separate cover).

LCD Blinks ** LOW ALARM **, ** HIGH ALARM ** or ** TRBL ALARM**

The LCD will alternately flash to indicate an active alarm condition for the type of alarm that has been set. The LCD will display airflow/temperature readings in between these alarm notifications. Alarm notifications will cease when the alarm is cleared. For additional alarm information, refer to the previous **GTA116 Alarm Output Features** section of this document.

**APPENDIX A -
GTA116 WIRING DIAGRAM**



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