Advantage
Gold Series by Ebtron

GTx116 "Plug & Play" Transmitters
Installation & Configuration Guide

Firmware Version 2.xx

Includes analog output models: GTA116-P, GTA116-F & GTA116-B
Includes network output models: GTN116-P, GTN116-F & GTN116-B
GTx116.INSTALLf2.01

Configuration is a Feature, not a requirement on Plug & Play Transmitters

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Transmitter Installation

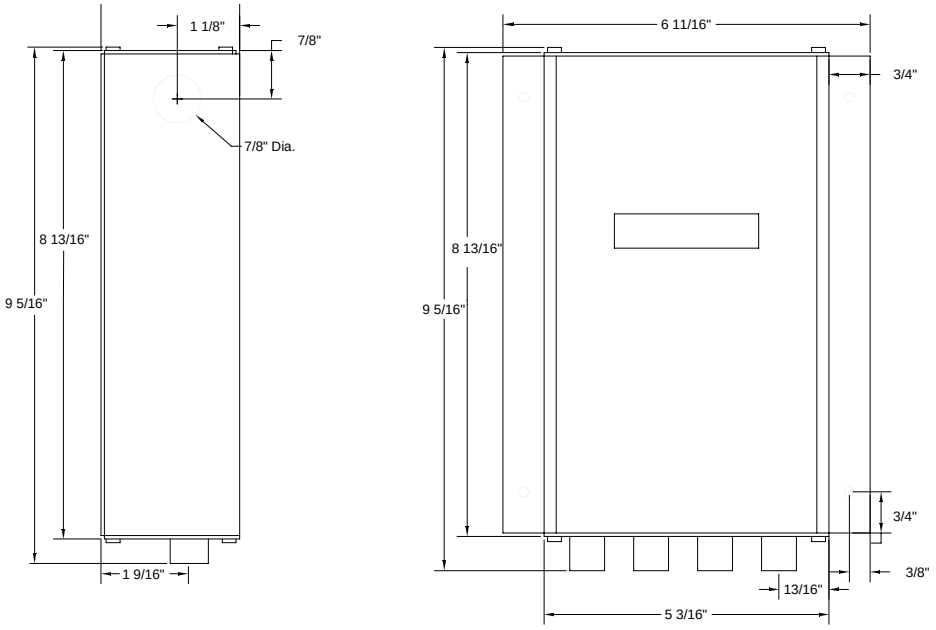
The **GTx116** transmitter aluminum chassis has been designed for use in a protected environment between 30° F and 120° F where it will not be exposed to rain or snow.

The transmitter should be mounted upright in a field accessible location. The chassis is designed to accept 3/4" conduit fittings for power and signal wiring at the top left and right of the enclosure. The transmitter should be located such that the connecting cables from all of the sensor probes reach the receptacles on the bottom of the transmitter enclosure.

Do not expose the transmitter to rain or snow without providing a NEMA4 enclosure. If the transmitter will be exposed to temperatures less than 30° F, a temperature controlled heater must be provided.

Leave at least 10 inches above, and 2 inches to each side and bottom, of unobstructed space around the transmitter to allow for heat dissipation and cover removal.

Transmitter Dimensions



Electrical Connections

All Transmitters

After mounting the sensor probes and transmitter, connect one or more sensor probe cable plugs to the circular receptacles located at the bottom of the **GTx116** transmitter enclosure. Probes are *"plug and play"* and do not have to be connected to a specific receptacle on the transmitter. 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 metal tags on the transmitter and sensor probes.

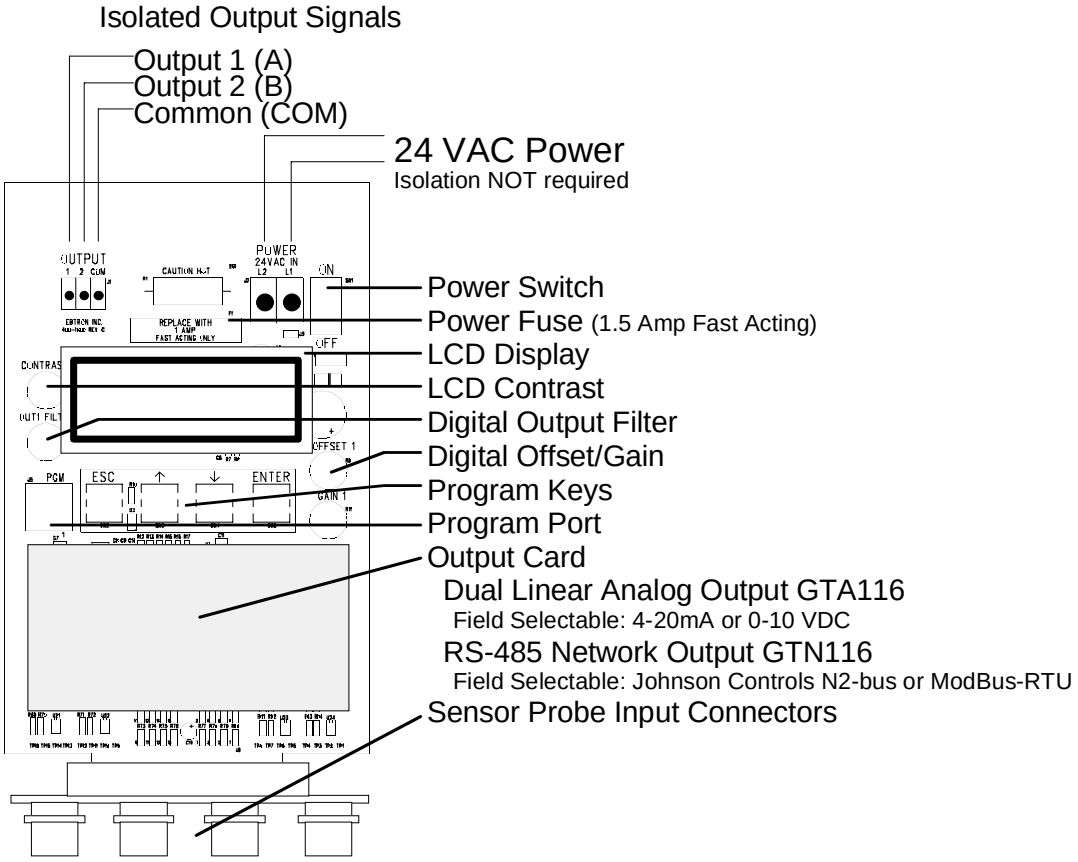
Do not drill into the transmitter chassis since metal shavings could damage the electronics.

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

24 VAC power should be connected to the large, two position power input terminal labeled "POWER" on the upper right hand side of the main circuit board. 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 on a single transformer must be wired "in-phase".

GTx116 Transmitter Wiring and Circuit Board Function Diagram



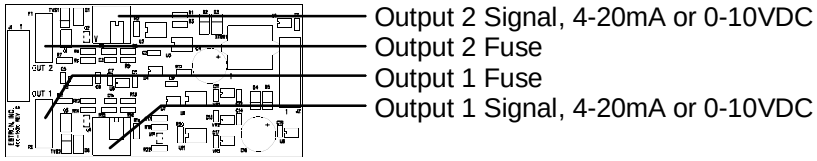
Analog Output GTA116 Transmitters

To wire the output signal and power, slide the cover plate up and out of the extruded chassis. Make sure that the power switch is in the "OFF" position. The **GTA116** wiring schematic is shown above. Signal wires for airflow and temperature should be connected to the small, three position output terminal labeled "OUTPUT" on the upper left hand side of the main circuit board.

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

The transmitter is factory shipped with the analog output signals set to the 4-20mA default. If a 0-10 VDC output is desired, simply move the corresponding switch (SW1 for Output 1, SW2 for Output 2) to the 0-10 VDC position prior to power-up (see figure below). If the output signal switches are moved after power up, the transmitter must be turned off and then on for the new switch positions to be activated. Since the accuracy of the GTA116 is "percent of reading" there should be no need to reconfigure the default output scales listed inside of the transmitter cover. However, factory default settings can be easily reconfigured in the field (see: **Changing Factory Default Settings**)

GTA116 Analog Output Card

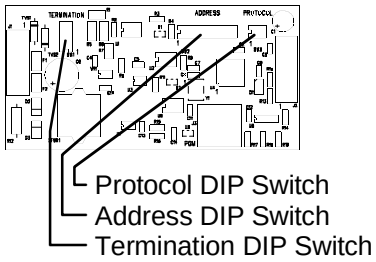


RS-485 Network GTN116 Transmitters for Johnson Controls N2-bus or ModBus-RTU

To wire the output signal and power, slide the cover plate up and out of the extruded chassis. Make sure that the power switch is in the "OFF" position. The **GTN116** wiring schematic is shown above. The RS-485 network cable should be connected to the small, three position output terminal labeled "OUTPUT" on the upper left hand side of the main circuit board.

Each transmitter must be configured for proper protocol, address, and termination. The transmitter is factory shipped with the protocol set to the Johnson Controls N2-bus, address 0, and no termination. If the DIP switches are moved after power up, the transmitter must be turned off and then on for the new switch positions to be activated. DIP switches are located on the output card. The location of the switches with their settings are indicated in the figures on the next page.

GTN116 RS-485 Network Output Card



TECHNICAL DATA

Protocol	Johnson Controls N2-bus or Modbus-RTU
Physical Interface	9600 Baud RS-485 Serial, no parity, 8 data bits, 1 stop bit
Cabling	Twisted shielded pair
Interface	Analog and binary input points (registers) for airflow, dynamic pressure, temperature, and status
Connectors	Terminal Block
Topology	"Daisy-chained" multi-drop bus
Unit Load	1/4 (128 devices)

Protocol DIP Switch

Pos.		Protocol
1	2	
off	off	JCI N2-bus
off	**on**	ModBus-RTU

Address DIP Switch

DIP Switch Position								Address
1	2	3	4	5	6	7	8	
off	off	off	off	off	off	off	off	0
off	off	off	off	off	off	off	**on**	1
off	off	off	off	off	off	**on**	off	2
off	off	off	off	off	off	**on**	**on**	3
:	:	:	:	:	:	:	:	:
on	**on**	**on**	**on**	**on**	**on**	**on**	**on**	255

Termination DIP Switch

DIP Switch Position				Termination
1	2	3	4	
off	off	off	off	No Termination
off	**on**	**on**	off	End of Line
on	off	off	**on**	Fail-safe Bias

POINT MAP

Johnson Controls N2-bus		**ModBus-RTU**						
NPT[1]	NPA[2]	Function	Register	Length	Units	Point Description	Range/Value	Notes
AI	1	04	30001	2[a]	FPM	Airflow	0 to 10,000	
AI	2	04	30002	2[a]	in.w.c.	Differential Pressure	-0.5 to +0.5	GTN116-B Only
AI	3	04	30003	2[a]	°F	Temperature	-20 to +160	
BI	1	02	10001	1[b]		Status	0:OK, 1:Trbl.	
[1]Network Point Type		[a]IEEE Floating Point (4 bytes total)						
[2]Network Point Address		[b]Binary (1 byte total)						

Setting Transmitter Network Protocol

Transmitter protocol can be changed in the field by setting the DIP switch labeled "PROTOCOL" on the Network Output Card.

Setting Transmitter Address

Each transmitter must be assigned a **unique** address between 1 and 255 prior to power up by setting the DIP switch labeled "ADDRESS" on the Network Output Card. The least significant bit (LSB) is switch position number 8.

Setting Transmitter Termination

Transmitter termination can be changed in the field by setting the DIP switch labeled "TERMINATION" on the Network Output Card. Termination options are "No Termination", "End of Line", or "Fail-safe Bias".

Start-up

When installed in accordance with installation guidelines, no adjustment or calibration is necessary. To assure a successful startup, check that the airflow measuring station is installed in accordance with this document.

Check the physical installation, power connections, and signal wiring prior to turning the power switch to the "ON" position.

Move the power switch to the "ON" position. The transmitter executes a complete self-check each time the power is turned on. Check that scaling in the host control system returns an output that matches the output of the **GTx116**.

The **GTA116** is designed to operate on "power-up". Default output signals are set to 4-20mA. No field configuration is required. The **GTN116** must be properly configured based on the system network protocol. If factory default settings require a change in the field, review **Changing Factory Default Settings** or contact ***EBTRON*** Customer Service, toll free, at **800-232-8766**.

Maintenance

Periodic maintenance or recalibration is neither required nor recommended[1].

[1]In extremely dirty environments, periodic inspection of the sensor element is advised. Carefully remove any excessive buildup of material with compressed air or with a small brush. Recalibration is not required.

Converting the Output Signal to Volumetric Flow (CFM or LPS)

The equivalent volumetric flow full scale reading can easily be determined by multiplying the full scale reading selected in the ***Setup Menu*** by the free area where the airflow measuring station is located. For **-P** units, the free area is printed on the hang-tag of each sensor probe. For **-F** and **-B** units, the free area should be determined after the units are installed. The factory default scaling is shown on the next page. Since the sensor probes are percent of reading devices, changing the full scale on **GTA116** analog output transmitters will not improve accuracy and is generally not required.

Changing the LCD Display to Indicate Volumetric Flow (CFM or LPS)

GTX116 transmitters are shipped to display velocity, not volumetric flow. To change the LCD for volumetric flow indication, enter the ***Setup Menu*** and change the menu item "*LCD U/M = FPM" to "*LCD U/M = CFM" ("*LCD U/M = MPS" to "*LCD U/M = LPS" for S.I. units). After changing the display units, you will be prompted to enter the free area where the airflow measuring station is installed. Changing the display units will not affect the output signal of the transmitter.

Adjusting the Factory Calibration

The factory calibration should not require adjustment if the sensor probes are installed in accordance with published installation guidelines. However, certain installations may not meet installation guidelines or commissioning requirements may dictate field adjustment. The **GTX116** firmware version 2.08 and lower can be adjusted for output 1 signal "offset" and "gain" on **-P** and **-F** units. The **GTX116** firmware version 2.09 output signal can be adjusted for output 1 signal "gain" only. To adjust the output signal "gain", the "Factory Cal" override must be set to "*Factory Cal=OFF" from the Setup Menu. The adjustments affect both the LCD display and output signal. When "*Factory Cal=ON" is set, adjusting the output signal "offset" and/or "gain" will not affect the output of the transmitter.

Adjusting the Digital Output Filter

The digital output filter is useful for dampening signal fluctuations resulting from transient wind gusts on outdoor air intakes or excessive turbulence generated from duct disturbances. The digital output filter range can be set between "Off" (0) and 99%. Increasing the filter percentage limits the allowable change of the output signal. The output filter setting can be changed at any time by adjusting the potentiometer on the main circuit board labeled "Out1 Filter". Turning the potentiometer clockwise increases the amount of filtering. To view the setting of the output filter, enter the ***Setup Menu*** and navigate to "*Filter = {current setting}".

Replacing Transmitter Circuit Boards

In the unlikely event that one of the transmitter boards fail follow the following procedure:

1. Move the power switch to the "off" position.
2. Remove the circuit board.
    - Main **GTX116** circuit board: Disconnect power and signal wiring and remove the four screws holding the plate at the top of the enclosure. Slide the circuit board out of the chassis.
    - Output card: Carefully pull the output card off of the **GTX116** circuit board being careful not to bend any of the pins on the **GTX116** circuit board.
3. Reinstall the circuit board and connect any power and signal wires that were removed.
4. Make sure all sensor probes are connected to the transmitter and move the power switch to the "on" position.

Replacing or Adding Sensor Probes

In the unlikely event that one of the sensor probes need to be replaced or added follow the following procedure:

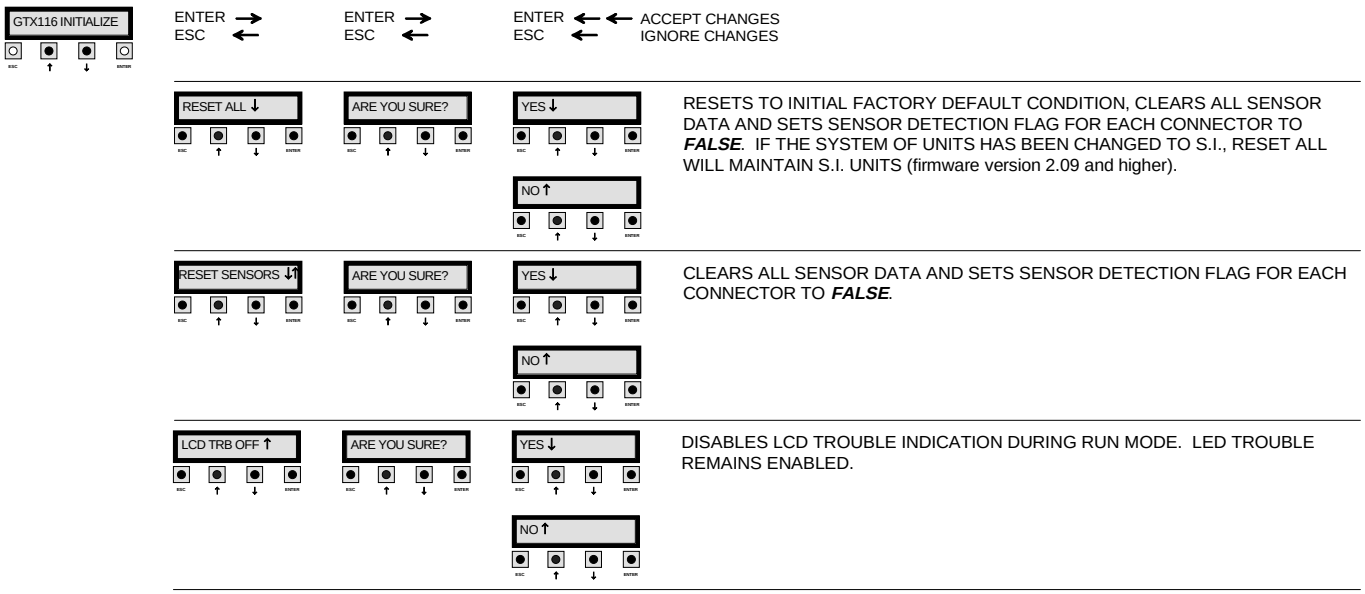
1. Move the power switch to the "off" position.
2. Remove any installed sensor probe(s) that need to be replaced.
3. Install the new sensor probe(s) and connect them to the transmitter.
4. Make sure all sensor probes are connected to the transmitter and move the power switch to the "on" position.

Sending Null and Full Scale Signals on GTA116 Transmitters

The **GTA116** transmitter can be set up to send both null and full scale signals to the host controls by forcing the transmitter into the catastrophic failure "ONFAIL" mode. Remove all sensor probes from the transmitter to simulate a catastrophic sensor failure. To send a null signal (0 VDC or 4 mA, depending on the output signal selected), enter the ***Setup Menu*** and set the "ON FAIL" to minimum scale for the output you wish to verify (example for Output 1: "*ONFAIL1 = MS1"). To send a full scale signal (10 VDC or 20 mA, depending on the output signal selected), enter the ***Setup Menu*** and set the "ON FAIL" to full scale scale for the output you wish to verify (example for Output 1: "*ONFAIL1 = FS1"). Set "ONFAIL" to the setting you desire during operation when complete.

Transmitter Initialization

The **GTx116 Transmitter** automatically initializes at power-up and conducts full system diagnostics. **Under normal conditions, there is no reason to enter the *Initialization* mode.** The transmitter should only be initialized if a.) it is desired to reset the transmitter to the *Factory Default Settings* or b.) one or more probes are permanently removed from its receptacle. To enter the ***Initialization*** mode, simultaneously press the **Enter** and **Escape** keys during the first 10 seconds after transmitter power-up. Navigate through the menus using the flow chart below.



Changing Factory Default Settings & Entering Diagnostic Mode

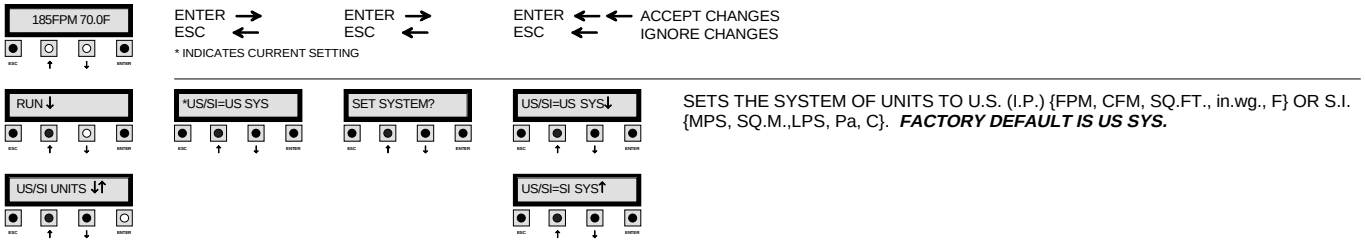
The **GTx116 Transmitter** has been setup and tested at the factory and fully operational when sensor probes are connected and power is applied by turning the power switch to the 'on' position. The transmitter automatically determines the type of sensors connected and defaults to predetermined factory settings. Factory settings can easily be changed in the field by entering the ***Main Menu*** by simultaneously pressing the **Up** and **Down** keys while the transmitter is in its normal operating mode. Navigate through the menus using the following flow charts. The configuration flow charts are divided into ***System of Units, Setup,*** *and* ***Diagnostics.***

Factory Defaults for GP1 (-P) ,GF1 (-F), GB1 (-B) Sensor Probes:

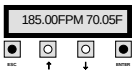
System of measure: US (I-P)
Output 1 units of measure: FPM
Output 2 units of measure: °F (-P,-F), +/- in.wg. (-B)
LCD display: FPM and ° F (-P,-F), FPM (-B)
Analog output signals[1]: Output 1 = 4-20mA, Output 2 = 4-20mA
Output 1 scale[1]: 0 to full scale
full scale = 5,000 FPM (-P), 10,000 FPM (-F), 3,000 FPM (-B)
Output 2 scale[1]: -20° F to +160° F (-P,-F), +/- 0.50 in.wg. (-B)
Digital output filter: OFF
[1]*GTA116 Transmitters*

System of measure: SI
Output 1 units of measure: MPS
Output 2 units of measure: °C (-P,-F), +/- Pa. (-B)
LCD display: MPS and ° C (-P,-F), MPS (-B)
Analog output signals[1]: Output 1 = 4-20mA, Output 2 = 4-20mA
Output 1 scale[1]: 0 to full scale
full scale = 25 MPS (-P), 50 MPS (-F), 25 MPS (-B)
Output 2 scale[1]: -30° C to +70° C (-P,-F), +/- 125 Pa (-B)
Digital output filter: OFF
[1]*GTA116 Transmitters*

Changing the System of Units



Changing the Setup Configuration on GP1 & GF1 Sensor Probes (I-P units)



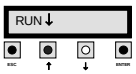
ENTER → ESC ←

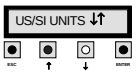
ENTER → ESC ←

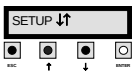
ENTER ← ← ACCEPT CHANGES
ESC ← IGNORE CHANGES

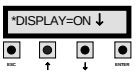
* INDICATES CURRENT SETTING

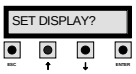
RECTANGULAR FREE AREA = W X H / 144
ROUND FREE AREA = D X D X 3.14/ 576
OVAL FREE AREA = [(3.14 / 4 X H X H) + ((W - H) X H)] / 144

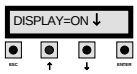


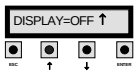




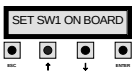




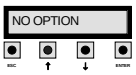




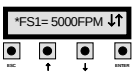
DISPLAY "ON" WILL INDICATE BOTH **AIRFLOW** AND **TEMPERATURE**. DISPLAY "OFF" WILL INDICATE **GTX116 RUN.** ***FACTORY DEFAULT IS "ON".***

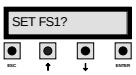


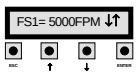
OUTPUT 1, AIRFLOW, IS SELECTED WITH A PHYSICAL SWITCH LABELED "SW1" ON THE OUTPUT CARD. POWER MUST BE TURNED OFF THEN ON TO ACTIVATE. ***FACTORY DEFAULT IS 4-20mA.***.



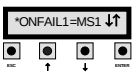
MINIMUM SCALE CAN NOT BE CHANGED FROM 0 FPM FOR AIRFLOW.

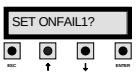


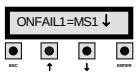


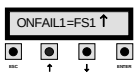


FULL SCALE CAN BE SET BETWEEN 100 AND 10,000 FPM AT 100 FPM INCREMENTS. **UNITS ARE VELOCITY ONLY.** TO CONVERT TO CFM, SIMPLY MULTIPLY BY THE AREA (SQ.FT.) OF THE DUCT OR PLENUM. ***FACTORY DEFAULT IS 5,000 FPM (-P), 10,000 FPM (-F).***

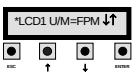


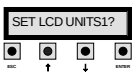




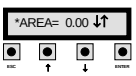


ANALOG OUTPUT SETTING FOR AIRFLOW ON TOTAL SENSOR FAILURE . ***FACTORY DEFAULT = MS1.***

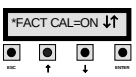


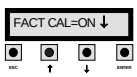


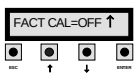
THE LCD DISPLAY UNITS OF MEASURE ARE IN FPM OR CFM IN THE U.S. (I.P.) SYSTEM. CFM REQUIRES THAT THE AREA (BELOW) IS SET PROPERLY. ***FACTORY DEFAULT IS FPM.***



AREA IN SQUARE FEET FROM 0.00 TO 999.99 IN 0.01 INCREMENTS. THE LONGER YOU HOLD DOWN THE UP OR DOWN ARROW KEYS, THE FASTER THE INCREMENT WILL CHANGE. ***FACTORY DEFAULT IS 0.00 SQ.FT.***

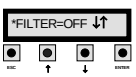


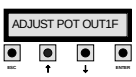




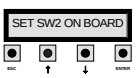
FACTORY CAL "ON" OVERRIDES ANY SETTINGS OF THE DIGITAL OFFSET AND GAIN POTENTIOMETERS, "OFFSET 1" AND "GAIN 1", FOR OUTPUT 1 ON THE GTX116 CIRCUIT BOARD. FACTORY CAL MUST BE SET TO "OFF" TO ALLOW FIELD ADJUSTMENTS. ***FACTORY DEFAULT IS "ON".***

FIELD ADJUSTMENTS AFFECT BOTH THE ANALOG OUTPUT AND THE DISPLAYED OUTPUT.

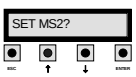


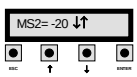


THE DAMPENING FILTER IS ACTIVATED BY ADJUSTING DIGITAL POTENTIOMETER "OUT1 FILTER" ON THE GTX116 CIRCUIT BOARD. THE AMOUNT OF FILTERING, OFF TO 99% WILL BE DISPLAYED AS "FILTER=__%" ON THE LCD DISPLAY. FILTERING IS USEFUL WHEN TURBULENCE FROM THE SENSOR LOCATION OR WINDS ON OUTSIDE AIR INTAKES CREATE EXCESSIVE SIGNAL VARIATIONS. ***FACTORY DEFAULT IS "OFF".***

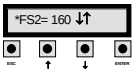


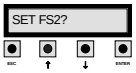
OUTPUT 2, TEMPERATURE, IS SELECTED WITH A PHYSICAL SWITCH LABELED "SW2" ON THE OUTPUT CARD. POWER MUST BE TURNED OFF THEN ON TO ACTIVATE. ***FACTORY DEFAULT IS 4-20mA.***

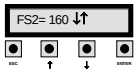




MINIMUM SCALE CAN BE SET BETWEEN -50FAND 150F AND CAN BE ADJUSTED AT 10F INTERVALS. ***FACTORY DEFAULT IS -20.***





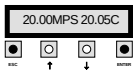


FULL SCALE CAN BE SET BETWEEN -40F AND 160F AND CAN BE ADJUSTED AT 10F INTERVALS. THE FULL SCALE MUST BE 10F HIGER THAN THE MINIMUM SCALE. ***FACTORY DEFAULT IS 160***

ANALOG OUTPUT SETTING FOR TEMPERATURE ON TOTAL SENSOR FAILURE. ***FACTORY DEFAULT = MS2.***

Note: Analog output, minimum scale, full scale, and on-fail menu items appear on GTA116 transmitters only.

Changing the Setup Configuration on GP1 & GF1 Sensor Probes (S.I. units)



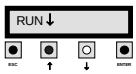
ENTER → ESC ←

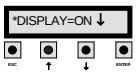
ENTER → ESC ←

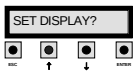
ENTER ← ← ACCEPT CHANGES
ESC ← IGNORE CHANGES

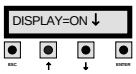
* INDICATES CURRENT SETTING

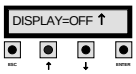
RECTANGULAR FREE AREA = W X H
ROUND FREE AREA = D X D X 3.14/ 4
OVAL FREE AREA = [(3.14 / 4 X H X H) + ((W - H) X H)]



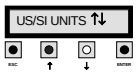


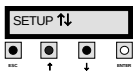


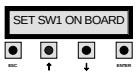




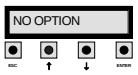
DISPLAY "ON" WILL INDICATE BOTH **AIRFLOW** AND **TEMPERATURE**.
DISPLAY "OFF" WILL INDICATE **GTX116 RUN.** ***FACTORY DEFAULT IS "ON".***



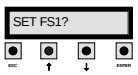


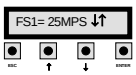


OUTPUT 1, AIRFLOW, IS SELECTED WITH A PHYSICAL SWITCH LABELED "SW1" ON THE OUTPUT CARD. POWER MUST BE TURNED OFF THEN ON TO ACTIVATE. ***FACTORY DEFAULT IS 4-20mA.***.

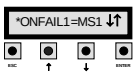


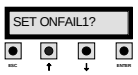
MINIMUM SCALE CAN NOT BE CHANGED FROM 0 MPS FOR AIRFLOW.

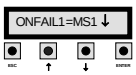


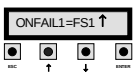


FULL SCALE CAN BE SET BETWEEN 5 AND 50 MPS AT 0.1 MPS INCREMENTS. **UNITS ARE VELOCITY ONLY.** TO CONVERT TO l/s, SIMPLY MULTIPLY BY THE AREA (SQ.M.) OF THE DUCT OR PLENUM x1000.
FACTORY DEFAULT IS 25 MPS (-P), 50 MPS (-F).

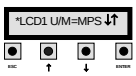


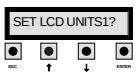


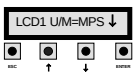




ANALOG OUTPUT SETTING FOR AIRFLOW ON TOTAL SENSOR FAILURE .
FACTORY DEFAULT = MS1.

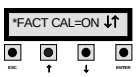


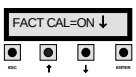


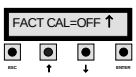


THE LCD DISPLAY UNITS OF MEASURE ARE IN MPS OR LPS IN THE S.I. SYSTEM. LPS REQUIRES THAT THE AREA (BELOW) IS SET PROPERLY.
FACTORY DEFAULT IS MPS.

AREA IN SQUARE METERS FROM 0.00 TO 999.99 IN 0.01 INCREMENTS. THE LONGER YOU HOLD DOWN THE UP OR DOWN ARROW KEYS, THE FASTER THE INCREMENT WILL CHANGE. ***FACTORY DEFAULT IS 0.00 SQ.M.***

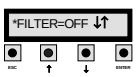


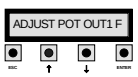




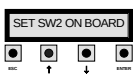
FACTORY CAL "ON" OVERRIDES ANY SETTINGS OF THE DIGITAL OFFSET AND GAIN POTENTIOMETERS, "OFFSET 1" AND "GAIN 1", FOR OUTPUT 1 ON THE GTX116 CIRCUIT BOARD. FACTORY CAL MUST BE SET TO "OFF" TO ALLOW FIELD ADJUSTMENTS. ***FACTORY DEFAULT IS "ON".***

FIELD ADJUSTMENTS AFFECT BOTH THE ANALOG OUTPUT AND THE DISPLAYED OUTPUT.

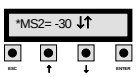


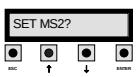


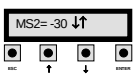
THE DAMPENING FILTER IS ACTIVATED BY ADJUSTING DIGITAL POTENTIOMETER "OUT1 FILTER" ON THE GTX116 CIRCUIT BOARD. THE AMOUNT OF FILTERING, OFF TO 99% WILL BE DISPLAYED AS "FILTER=__%" ON THE LCD DISPLAY. FILTERING IS USEFUL WHEN TURBULENCE FROM THE SENSOR LOCATION OR WINDS ON OUTSIDE AIR INTAKES CREATE EXCESSIVE SIGNAL VARIATIONS. ***FACTORY DEFAULT IS "OFF".***



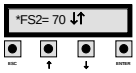
OUTPUT 2, TEMPERATURE, IS SELECTED WITH A PHYSICAL SWITCH LABELED "SW2" ON THE OUTPUT CARD. POWER MUST BE TURNED OFF THEN ON TO ACTIVATE. ***FACTORY DEFAULT IS 4-20mA.***

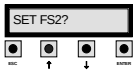


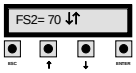




MINIMUM SCALE CAN BE SET BETWEEN -40C AND 60C AND CAN BE ADJUSTED AT 10C INTERVALS. ***FACTORY DEFAULT IS -30.***





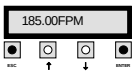


FULL SCALE CAN BE SET BETWEEN -30C AND 70C AND CAN BE ADJUSTED AT 10C INTERVALS. THE FULL SCALE MUST BE 10F HIGER THAN THE MINIMUM SCALE. ***FACTORY DEFAULT IS 70.***

ANALOG OUTPUT SETTING FOR TEMPERATURE ON TOTAL SENSOR FAILURE.
FACTORY DEFAULT = MS2.

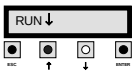
Note: Analog output, minimum scale, full scale, and on-fail menu items appear on GTA116 transmitters only.

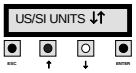
Changing the Setup Configuration on GB1 Sensor Probes (I-P units)

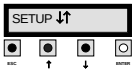


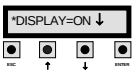
ENTER → ESC ← | ENTER → ESC ← | ENTER ← ESC ← ACCEPT CHANGES IGNORE CHANGES

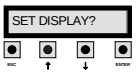
* INDICATES CURRENT SETTING

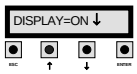


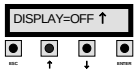




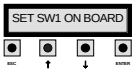




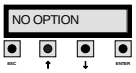




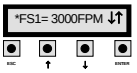
DISPLAY "ON" WILL INDICATE EITHER **AIRFLOW** OR **DYNAMIC PRESSURE** DISPLAY "OFF" WILL INDICATE **GTX116 RUN.** ***FACTORY DEFAULT IS "ON".***

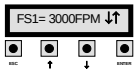


OUTPUT 1, AIRFLOW, IS SELECTED WITH A PHYSICAL SWITCH LABELED "SW1" ON THE OUTPUT CARD. POWER MUST BE TURNED OFF THEN ON TO ACTIVATE. ***FACTORY DEFAULT IS 4-20mA.***.

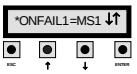


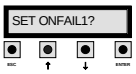
MINIMUM SCALE CAN NOT BE CHANGED FROM 0 FPM FOR AIRFLOW.

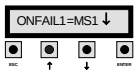




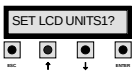
FULL SCALE CAN BE SET BETWEEN 100 AND 10,000 FPM AT 100 FPM INCREMENTS. **UNITS ARE VELOCITY ONLY.** TO CONVERT TO CFM, SIMPLY MULTIPLY BY THE AREA (SQ.FT.) OF THE LOUVER OR OPENING. ***FACTORY DEFAULT IS 3,000 FPM (-B)***

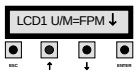






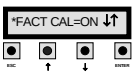
ANALOG OUTPUT SETTING FOR AIRFLOW ON TOTAL SENSOR FAILURE . ***FACTORY DEFAULT = MS1 .***

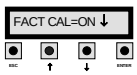


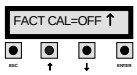


THE LCD DISPLAY UNITS OF MEASURE ARE IN FPM, CFM OR IN.WG. IN THE U.S. (I.P.) SYSTEM. CFM REQUIRES THAT THE AREA (BELOW) IS SET PROPERLY. ***FACTORY DEFAULT IS FPM.***

AREA IN SQUARE FEET FROM 0.00 TO 999.99 IN 0.01 INCREMENTS. THE LONGER YOU HOLD DOWN THE UP OR DOWN ARROW KEYS, THE FASTER THE INCREMENT WILL CHANGE. ***FACTORY DEFAULT IS 0.00 SQ.FT.***

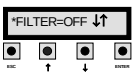


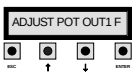




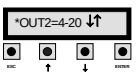
FACTORY CAL "ON" OVERRIDES ANY SETTINGS OF THE DIGITAL OFFSET AND GAIN POTENTIOMETERS, "OFFSET 1" AND "GAIN 1", FOR OUTPUT 1 ON THE GTX116 CIRCUIT BOARD. FACTORY CAL MUST BE SET TO "OFF" TO ALLOW FIELD ADJUSTMENTS. ***FACTORY DEFAULT IS "ON".***

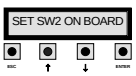
FIELD ADJUSTMENTS AFFECT BOTH THE ANALOG OUTPUT AND THE DISPLAYED OUTPUT.



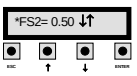


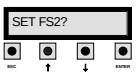
THE DAMPENING FILTER IS ACTIVATED BY ADJUSTING DIGITAL POTENTIOMETER "OUT1 FILTER" ON THE GTX116 CIRCUIT BOARD. THE AMOUNT OF FILTERING, OFF TO 99% WILL BE DISPLAYED AS "FILTER=__%" ON THE LCD DISPLAY. FILTERING IS USEFUL WHEN TURBULENCE FROM THE SENSOR LOCATION OR WINDS ON OUTSIDE AIR INTAKES CREATE EXCESSIVE SIGNAL VARIATIONS. ***FACTORY DEFAULT IS "OFF".***

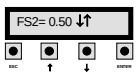




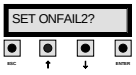
OUTPUT 2, DYNAMIC PRESSURE, IS SELECTED WITH A PHYSICAL SWITCH LABELED "SW2" ON THE OUTPUT CARD. POWER MUST BE TURNED OFF THEN ON TO ACTIVATE. ***FACTORY DEFAULT IS 4-20mA.***







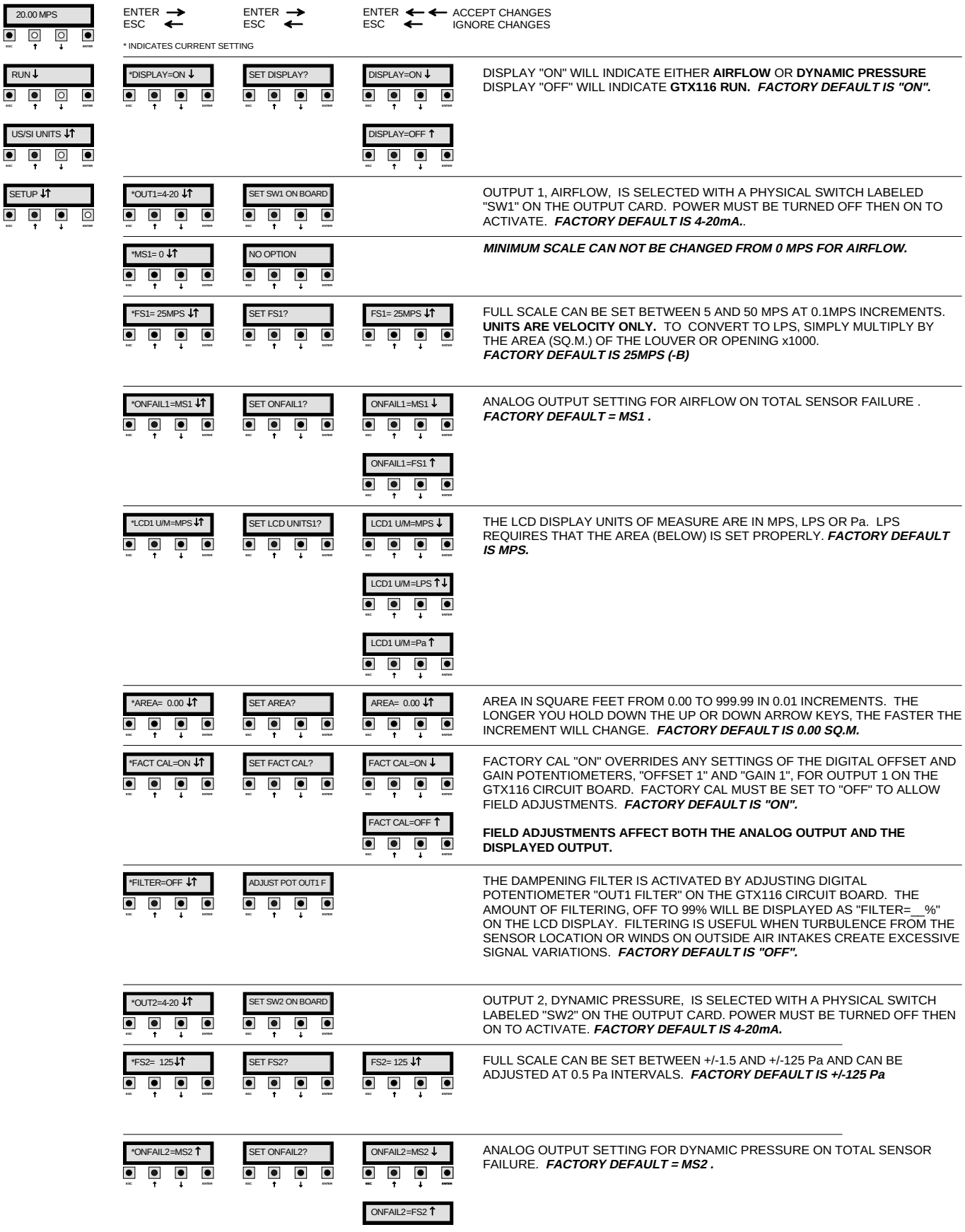
FULL SCALE CAN BE SET BETWEEN +/-0.01 AND +/-0.01 in.wg. AND CAN BE ADJUSTED AT 0.01 in.wg. INTERVALS. THE FULL SCALE MUST BE 10F HIGER THAN THE MINIMUM SCALE. ***FACTORY DEFAULT IS +/-0.50 in.wg.***



ANALOG OUTPUT SETTING FOR DYNAMIC PRESSURE ON TOTAL SENSOR FAILURE. ***FACTORY DEFAULT = MS2 .***

Note: Analog output, minimum scale, full scale, and on-fail menu items appear on GTA116 transmitters only.

Changing the Setup Configuration on GB1 Sensor Probes (S.I. units)



DISPLAY "ON" WILL INDICATE EITHER **AIRFLOW** OR **DYNAMIC PRESSURE**
DISPLAY "OFF" WILL INDICATE **GTX116 RUN.** ***FACTORY DEFAULT IS "ON".***

OUTPUT 1, AIRFLOW, IS SELECTED WITH A PHYSICAL SWITCH LABELED "SW1" ON THE OUTPUT CARD. POWER MUST BE TURNED OFF THEN ON TO ACTIVATE. ***FACTORY DEFAULT IS 4-20mA.***.

MINIMUM SCALE CAN NOT BE CHANGED FROM 0 MPS FOR AIRFLOW.

FULL SCALE CAN BE SET BETWEEN 5 AND 50 MPS AT 0.1MPS INCREMENTS. **UNITS ARE VELOCITY ONLY.** TO CONVERT TO LPS, SIMPLY MULTIPLY BY THE AREA (SQ.M.) OF THE LOUVER OR OPENING x1000.
FACTORY DEFAULT IS 25MPS (-B)

ANALOG OUTPUT SETTING FOR AIRFLOW ON TOTAL SENSOR FAILURE .
FACTORY DEFAULT = MS1 .

THE LCD DISPLAY UNITS OF MEASURE ARE IN MPS, LPS OR Pa. LPS REQUIRES THAT THE AREA (BELOW) IS SET PROPERLY. ***FACTORY DEFAULT IS MPS.***

AREA IN SQUARE FEET FROM 0.00 TO 999.99 IN 0.01 INCREMENTS. THE LONGER YOU HOLD DOWN THE UP OR DOWN ARROW KEYS, THE FASTER THE INCREMENT WILL CHANGE. ***FACTORY DEFAULT IS 0.00 SQ.M.***

FACTORY CAL "ON" OVERRIDES ANY SETTINGS OF THE DIGITAL OFFSET AND GAIN POTENTIOMETERS, "OFFSET 1" AND "GAIN 1", FOR OUTPUT 1 ON THE GTX116 CIRCUIT BOARD. FACTORY CAL MUST BE SET TO "OFF" TO ALLOW FIELD ADJUSTMENTS. ***FACTORY DEFAULT IS "ON".***

FIELD ADJUSTMENTS AFFECT BOTH THE ANALOG OUTPUT AND THE DISPLAYED OUTPUT.

THE DAMPENING FILTER IS ACTIVATED BY ADJUSTING DIGITAL POTENTIOMETER "OUT1 FILTER" ON THE GTX116 CIRCUIT BOARD. THE AMOUNT OF FILTERING, OFF TO 99% WILL BE DISPLAYED AS "FILTER=__%" ON THE LCD DISPLAY. FILTERING IS USEFUL WHEN TURBULENCE FROM THE SENSOR LOCATION OR WINDS ON OUTSIDE AIR INTAKES CREATE EXCESSIVE SIGNAL VARIATIONS. ***FACTORY DEFAULT IS "OFF".***

OUTPUT 2, DYNAMIC PRESSURE, IS SELECTED WITH A PHYSICAL SWITCH LABELED "SW2" ON THE OUTPUT CARD. POWER MUST BE TURNED OFF THEN ON TO ACTIVATE. ***FACTORY DEFAULT IS 4-20mA.***

FULL SCALE CAN BE SET BETWEEN +/-1.5 AND +/-125 Pa AND CAN BE ADJUSTED AT 0.5 Pa INTERVALS. ***FACTORY DEFAULT IS +/-125 Pa***

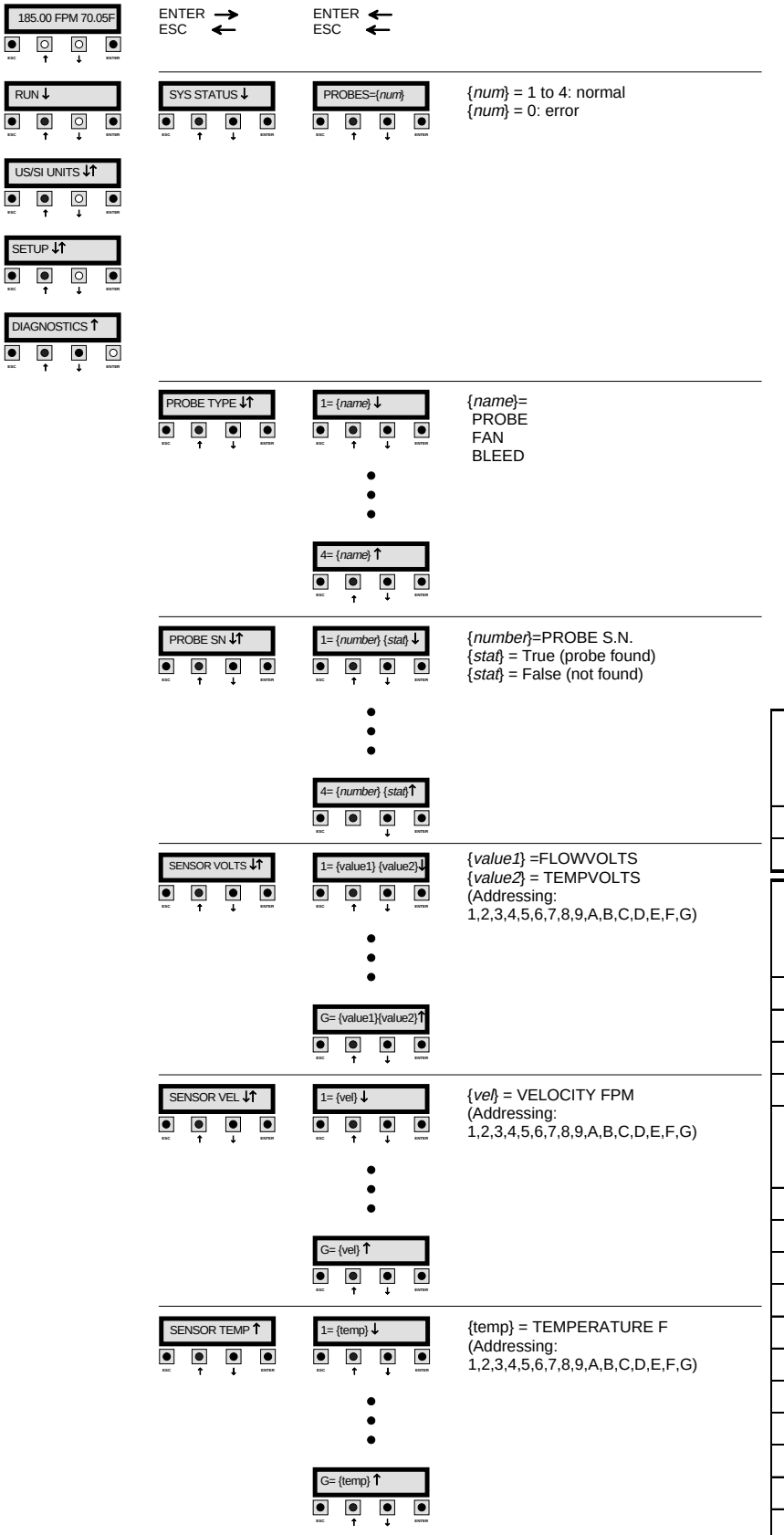
ANALOG OUTPUT SETTING FOR DYNAMIC PRESSURE ON TOTAL SENSOR FAILURE. ***FACTORY DEFAULT = MS2 .***

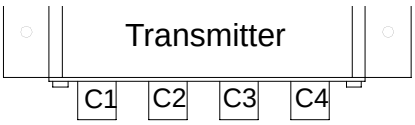
Note: Analog output, minimum scale, full scale, and on-fail menu items appear on GTA116 transmitters only.

Troubleshooting Guide

Problem	Possible Cause	Remedy
No LCD display indication and the green LED on the main circuit board is not illuminated.	Power switch not in the "on" position.	Move the power switch to the "on" position.
	Improper supply voltage to the power input terminal block.	Make sure that input power wires are connected to positions L1 and L2 of the POWER terminal block and the voltage with the power switch in the "on" position is between 22.5 and 29 VAC.
	Blown fuse	Check power wiring. Make sure that multiple devices wired on a single transformer are wired "in-phase". Replace with a 1.5 amp, fast acting fuse only after the problem has been determined and corrected.
No LCD display indication and the green LED on the main circuit board is flashing.	LCD contrast too low.	Turn the contrast potentiometer on the main circuit board "clockwise".
The LCD display is scrambled or there is no LCD display indication after touching the switches, LCD display, or circuit board.	Static electricity.	Touch an earth-grounded object, such as a duct, to discharge static electricity then reset the power. Avoid direct contact with the LCD display or circuit board.
The LCD display indicates "0.00 FPM and -459.7"	The power switch on the transmitter was moved to the "on" position before the sensor probes were connected.	Reset the power by moving the power switch from the "on" to "off" position and then back to the "on" position.
The LCD display indicates "DIFF SENSOR TYPE".	Sensor probes have been mismatched.	Transmitters must have the same sensor type connected (GP1, GF1, or GB1 sensor probes).
The LCD display indicates "TOO MANY SENSORS".	A probe with 5 or more sensors has been connected to a 'Type B' transmitter with 4 receptacles.	Probes with 5 or more sensors are shipped with and require a 'Type A' transmitter with 2 receptacles.
The last digit of the flow rate units is displayed as a lower case letter.	The sensor detection system has detected one or more malfunctioning or missing sensors.	Check sensor probe cable connections. If sensor probe connections look OK and match the number of sensor probes indicated on each probes hang tag, contact Ebtron customer service for diagnostic procedures.
The green LED on the main circuit board is "on" but not flashing.	The microprocessor is not running.	Reset the power by moving the power switch from the "on" to "off" position and then back to the "on" position.
The green LED on the main circuit board is flashing at 1 second intervals.	No problem, normal operation.	No remedy required.
The green LED on the main circuit board is flashing at 2 second intervals.	The sensor detection system has detected one or more malfunctioning or missing sensors.	Check sensor probe cable connections. If sensor probe connections look OK and match the number of sensor probes indicated on each probes hang tag, contact Ebtron customer service for diagnostic procedures.
No output signal can be measured at the OUTPUT terminal block of the GTA116 transmitter.	Output card is not securely mounted on main circuit board.	Press output card firmly onto main circuit board.
	Blown output fuse (output 1 and output 2 are fused and protected independently on GTA116 transmitters).	Make sure that power has not been connected to the output terminal block. Correct the problem and replace with 0.125 amp, fast acting fuse only.
		Make sure that your host controls is not configured for a 2-wire device (no excitation voltage should be present on the signals from the host controls). Correct the problem and replace with 0.125 amp, fast acting fuse only.
The 4-20 mA output signal on the GTA116 transmitter outputs less than 4 mA.	The analog output signal switch (SW1 for Output 1 or SW2 for Output 2) was moved to the 4-20 mA position after power-up.	Turn the power switch to the "off" position. Select the desired 4-20 mA output signal for output 1 (SW1) and/or output 2 (SW2). Turn the power switch to the "on" position.
The 0-10 VDC output signal on the GTA116 transmitter does not output less than 2 VDC.	The analog output signal switch (SW1 for Output 1 or SW2 for Output 2) was moved to the 0-10 VDC position after power-up.	Turn the power switch to the "off" position. Select the desired 0-10 VDC output signal for output 1 (SW1) and/or output 2 (SW2). Turn the power switch to the "on" position.
The host controls is unable to communicate with the GTN116 transmitter.	Output card is not securely mounted on main circuit board.	Press output card firmly onto main circuit board.
	Network protocol, address and/or termination has not been properly set on GTN116 transmitters.	Set network protocol, address and termination based on your network requirements.
The transmitter indicates airflow when the HVAC system is not operating.	Sensors are sensitive and can measure very low air velocities. If a reading is indicated, there is airflow present where the airflow measuring station is located.	Do not attempt to adjust zero ("offset"). Doing so will result in an error in airflow measurement.
The LCD display does not match the readings indicated by the host control system.	The output signal switches on a GTA116 transmitter have been changed after the power switch had been turned to the "on" position.	Reset the power by moving the power switch from the "on" to "off" position and then back to the "on" position.
	The scaling in the host control system is incorrect.	Compare the current configuration of the GTX116 transmitter with that of the host control system (on GTA116 transmitters compare the minimum and full scale settings for each output by navigating through the setup configuration menus).

Navigating through the Diagnostics Menu (All units)





Sensor Address: 1-9, A-G

Sensor position from terminal end of probe	Connector Position Type B - 4 input			
	C1	C2	C3	C4
1	D	9	1	5
2	E	A	2	6
3	F	B	3	7
4	G	C	4	8

Sensor Address: 1-9, A-G

Sensor position from terminal end of probe	Connector Position Type A - 2 input	
	C2	C3
1	9	1
2	A	2
3	B	3
4	C	4
5	D	5
6	E	6
7	F	7
8	G	8

Record ALL that apply (include units of measure)			
	LCD Display	Analog Output	Network Output
Output 1			
Output 2			

Record ALL Diagnostic Menu Data			
	PROBE TYPE	PROBE SN	
	{name}	*{number}*	*{stat}*
1			
2			
3			
4			

	SENSOR VOLTS		SENSOR VEL	SENSOR TEMP
	volts1	*volts2*	*vel*	*temp*
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				
G				

If you need to contact ***EBTRON*** customer service **(800 232-8766)**, record the reference and item numbers of the unit in question from the identification tag on the transmitter and probe(s). To facilitate service, fill out the troubleshooting data sheet on the right by collecting data from the diagnostic mode above.