



Thermal Dispersion Airflow Measurement

Advantage

SILVER Series

Troubleshooting & Diagnostics

STx104 Troubleshooting Guide

All Transmitters

Problem	Possible Cause	Remedy
The LED (LEDs on the STN104) on the main circuit board is not illuminated.	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 is between 22.4 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 0.5 Amp, fast acting fuse only after the problem has been determined and corrected.
The green LED (LEDs on the STN104) on the main circuit board is "on" but not flashing.	The microprocessor is not running.	Remove power and then reapply power to the transmitter.
The green LED (D3 on the STA104, D1 on the STN104) on the main circuit board is flashing at 1 second intervals.	No problem, normal operation.	No remedy required.
The green LED (D3 on the STA104, D1 on the STN104) 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, fill out the STx104 Diagnostic Measurement Form and contact Ebtron customer service.
	Sensors could have been plugged into different connectors after initialization of the transmitter.	Force the transmitter to clear and re-read the sensor data by moving all the DIP switches to the off position (ADDRESS DIP switches for the STN104) and cycling power to the transmitter. Return DIP switches to the previous position. This will also disable the GAIN adjustment pot on the STA104 if it was enabled.
The green LED (D3 on the STA104, D1 on the STN104) on the main circuit board is flashing at 4 second intervals.	The sensor detection system did not detect any sensors during initial startup.	Check sensor probe cable connections. If sensor probe connections look OK, remove and reapply power to the POWER terminal block.
The green LED (D3 on the STA104, D1 on the STN104) on the main circuit board is flashing at 0.5 second intervals.	A probe with 3 or more sensors has been connected to a 'Type B' or 'Type C' transmitter. A probe with 2 or more sensors has been connected to a 'Type C' transmitter.	Probes with 3 or more sensors are shipped with and require a 'Type A' transmitter with 1 receptacle. Probes with 2 sensors are shipped with and require either a 'Type A' or 'Type B' transmitter, 1 and 2 receptacles respectively.
The green LED (D3 on the STA104, D1 on the STN104) on the main circuit board is flashing at 0.25 second intervals.	Sensor probes have been mismatched.	Transmitters must have the same sensor type connected (SP1, SF1 or SU1 sensor probes).
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 the "gain". Doing so will result in error in airflow measurement (Gain adjustment is only available on the STA104).

STx104 Troubleshooting Guide

STA104 Transmitters (Analog Output)

Problem	Possible Cause	Remedy
No output signal can be measured at the OUTPUT terminal block of the STA104 transmitter.	Blown output fuse (output 1 and output 2 are fused and protected independently on STA104 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.
	Sensor data was not completely read during initial startup.	Make sure that your host control system 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 STA104 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,	Force the transmitter to clear and re-read the sensor data by moving all the DIP switches to the off position and cycling power to the transmitter. Return DIP switches to the previous position. This will also disable the GAIN adjustment pot if it was enabled.
The 0-10 VDC output signal on the STA104 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,	Remove power from the STA104 transmitter. Select the desired 4-20 mA output signal for output 1 (SW1) and/or output 2 (SW2). Reapply power to the transmitter.
The output signal on the STA104 transmitter rapidly fluctuates.	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,	Remove power from the STA104 transmitter. Select the desired 0-10 VDC output signal for output 1 (SW1) and/or output 2 (SW2). Reapply power to the transmitter.
The output signal on the STA104 transmitter rapidly fluctuates.	Electrical interference from other devices is creating noise in the signal wires to the host control system.	Verify that the output signal wiring to the host control system is shielded. Sources of electrical interference vary by location and can usually be resolved by connecting various points to Earth ground. Try individually grounding the following points, if that does not resolve the issue begin trying combinations of the points: signal wire shield at host controls, signal wire shield at STA104 transmitter, COM on the output terminal block of the STA104 (if host controls allows it), L2 of the power terminal block of the STA104 (if host controls allows it).
The GAIN potentiometer does not change the output signal.	The GAIN potentiometer is not enabled.	To enable the GAIN potentiometer, remove power from the STA104 transmitter. Move all of the DIP switches to the on position. Reapply power and wait for the green LED to begin flashing. Return the DIP switches to their previous position. You can now adjust the output signal with the GAIN potentiometer. To disable the GAIN potentiometer, repeat the steps above, but with the DIP switches in the off position.
The output signal does not properly relate to the reading in the host control system.	The scaling in the host control system is incorrect.	Compare the current configuration of the STA104 transmitter with that of the host control system (the minimum and full scale settings for each output are determined by the DIP switch settings, refer to the chart on the inside of the transmitter cover).

STx104 Troubleshooting Guide

STN104 Transmitters (RS485 Output)

Problem	Possible Cause	Remedy
The host control system is unable to communicate with the STN104 transmitter.	The network signal wiring is not properly connected to the STN104 transmitter or the host controls.	Verify that the network signal wires are connected to the proper positions of the OUTPUT terminal block on the STN104 transmitter and the host controls. On the STN104 transmitter OUTPUT terminal block, position 1 is for A, 2 for B and COM for common.
	The network protocol has not been properly set on the STN104.	Set network protocol based on your network requirements and reset transmitter power. See the transmitter installation and configuration guide for settings.
	The transmitter address has not been properly set on the STN104.	Set the address based on your network requirements and reset the transmitter power. See the transmitter installation and configuration guide for settings. Note that each address must be unique for the network and the least significant bit (LSB) is DIP switch position 8.
	The transmitter termination has not been properly set on the STN104.	Set the transmitter termination based on your network requirements and reset the transmitter power. See the transmitter installation and configuration guide for settings.
The host system is able to communicate with the STN104 transmitter but the returned point values are not valid.	Sensor data was not completely read during initial startup.	Force the transmitter to clear and re-read the sensor data by moving all the ADDRESS DIP switches to the off position and cycling power to the transmitter. Return DIP switches to the previous position.
The status point from the STN104 transmitter has a Trouble value.	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 probe's hang tag, fill out the STN104 Diagnostic Measurement Form and call Ebtron customer service.

STA104 Diagnostic Measurement Form

EBTRON customer service is available, free of charge, between the hours of 8:00 AM and 4:30 PM EST, Monday through Friday. Many customer service issues are easily resolved by using the troubleshooting guides in the installation instructions. If you need more information or believe that there may be a problem with the sensor probes or transmitter, enter the data in the form below before calling the service department. If you feel you may have an application issue, a sketch of the installation location along with control sequence of operations is recommended. Fax the completed information, if possible to 843-756-1838 before you call or have it available when speaking with a service representative. Address all correspondence to the *EBTRON Customer Service Department*. Completing the form will significantly facilitate field troubleshooting. Additional information is also available from your local *EBTRON* representative or 24 hours a day online at www.ebtron.com.

TAG INFORMATION		
Location Name:	Model:	Type:
Reference Number:	Item:	Number of Probes:
Duct Size: x (in / mm)	Internal Insulation:	

24 VAC Power Input:	VAC
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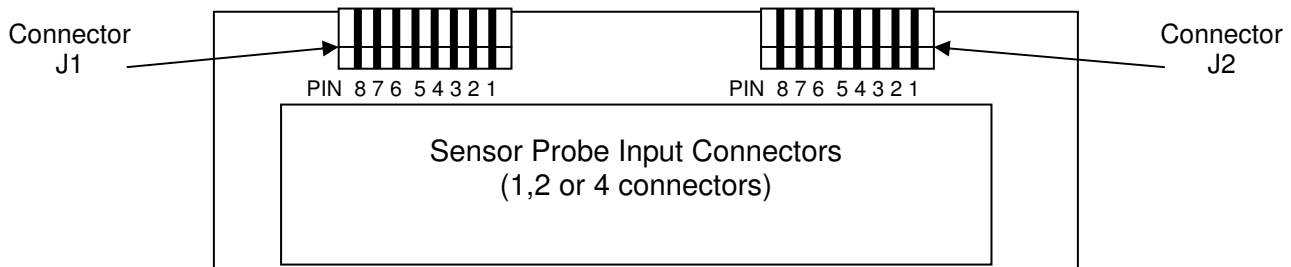
LED FLASH RATE
1 sec On / Off or 2 sec On / Off

SENSOR VOLTAGE READINGS		
Measure the DC voltages on the connector board listed below as referenced to the output common (see diagram below for detail of connector board).		
Pin #	Connector J1	Connector J2
1		
2		
3		
4		
5		
6		
7		
8		

DIP SWITCH & OUPUT SIGNAL SWITCH SETTINGS					
DIP1	DIP2	DIP3	DIP4	OUT1	OUT2
On / Off	On / Off	On / Off	On / Off	mA / VDC	mA / VDC

OUTPUT SIGNALS & FLOW RATE	
Please record the following information with the output signal wires disconnected:	
Velocity Output (1-COM):	mA / VDC
Temp Output (2-COM):	mA / VDC
Estimated Flow:	FPM / CFM / MPS / LPS

NULL & ½ SCALE CHECK	
Set all DIP switches to the ON position while the transmitter is powered On and record the following measurements:	
Velocity Output (1-COM):	mA / VDC
Temp Output (2-COM):	mA / VDC
Set all DIP switches to the OFF position while the transmitter is powered On and record the following measurements:	
Velocity Output (1-COM):	mA / VDC
Temp Output (2-COM):	mA / VDC



STN104 Diagnostic Measurement Form

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TAG INFORMATION		
Location Name:	Model:	Type:
Reference Number:	Item:	Number of Probes:
Duct Size: x (in / mm)	Internal Insulation:	

24 VAC Power Input:	VAC
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LED D1 FLASH RATE
1 sec On / Off or 2 sec On / Off

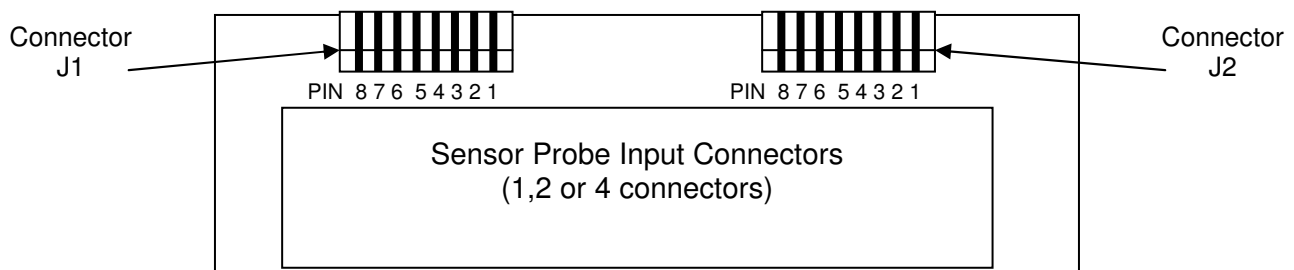
SENSOR VOLTAGE READINGS		
Measure the DC voltages on the connector board listed below as referenced to the output common (see diagram below for detail of connector board).		
Pin #	Connector J1	Connector J2
1		
2		
3		
4		
5		
6		
7		
8		

REQUIRED NETWORK SETTINGS	
Protocol:	JCI N2 / ModBus-RTU / BACnet MS-TP
Address:	
Termination:	No Termination / End of Line / Fail Safe Bias

ADDRESS DIP SWITCH SETTINGS			
DIP1	DIP2	DIP3	DIP4
On / Off	On / Off	On / Off	On / Off
DIP5	DIP6	DIP7	DIP8
On / Off	On / Off	On / Off	On / Off

TERMINATION DIP SWITCH SETTINGS			
DIP1	DIP2	DIP3	DIP4
On / Off	On / Off	On / Off	On / Off

PROTOCOL DIP SWITCH SETTINGS	
DIP1	DIP2
On / Off	On / Off



STA102 Troubleshooting Guide

Problem	Possible Cause	Remedy
The LED on the main circuit board is not illuminated.	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 is between 22.4 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 0.5 Amp, fast acting fuse only after the problem has been determined and corrected.
The green LED on the main circuit board is "on" but not flashing.	The microprocessor is not running.	Remove power and then reapply power to the transmitter.
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, fill out the STA102 Diagnostic Measurement Form and contact Ebtron customer service.
The green LED on the main circuit board is flashing at 4 second intervals.	The sensor detection system did not detect any sensors during initial startup.	Check sensor probe cable connections. If sensor probe connections look OK, remove and reapply power to the POWER terminal block.
No output signal can be measured at the OUTPUT terminal block of the STA102 transmitter.	Blown output fuse.	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.
	Sensor data was not completely read during initial startup.	Make sure that your host control system 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. Force the transmitter to clear and re-read the sensor data by moving all the DIP switches to the off position and cycling power to the transmitter. Return DIP switches to the previous position. This will also disable the GAIN adjustment pot if it was enabled.
The 4-20 mA output signal on the STA102 transmitter outputs less than 4 mA.	The analog output signal switch was moved to the 4-20 mA position after power-up,	Remove power from the STA102 transmitter. Slide the output signal switch to mA. Reapply power to the transmitter.
The 0-10 VDC output signal on the STA102 transmitter does not output less than 2 VDC.	The analog output signal switch was moved to the 0-10 VDC position after power-up,	Remove power from the STA102 transmitter. Slide the output signal switch to VDC. Reapply power to the transmitter.

STA102 Troubleshooting Guide

Problem	Possible Cause	Remedy
The output signal on the STA102 transmitter rapidly fluctuates.	Electrical interference from other devices is creating noise in the signal wires to the host control system.	Verify that the output signal wiring to the host control system is shielded. Sources of electrical interference vary by location and can usually be resolved by connecting various points to Earth ground. Try individually grounding the following points, if that does not resolve the issue begin trying combinations of the points: signal wire shield at host controls, signal wire shield at STA102 transmitter, (-) on the output terminal block of the STA102 (if host controls allows it), L2 of the power terminal block of the STA102 (if host controls allows it).
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.	No remedy required.
The output signal does not properly relate to the reading in the host control system.	The scaling in the host control system is incorrect.	Compare the current configuration of the STA102 transmitter with that of the host control system (the minimum and full scale settings for the output are determined by the DIP switch settings, refer to the chart on the inside of the transmitter cover).

STA102 Diagnostic Measurement Form

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TAG INFORMATION			
Location Name:	Model:	Type:	
Reference Number:	Item:	Number of Probes:	
Duct Size: x (in / mm)	Internal Insulation:		

DIP SWITCH & OUPUT SIGNAL SWITCH SETTINGS				
DIP1	DIP2	DIP3	DIP4	OUT1
On / Off	On / Off	On / Off	On / Off	mA / VDC

24 VAC Power Input Measurement:	VAC
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LED FLASH RATE	
Circle One:	1 sec On / Off or 2 sec On / Off

SENSOR VOLTAGE READINGS		
Measure the DC voltages on the following resistors as referenced to the output common.		
Resistor	Side	VDC
R18	Right	
R21	Left	
R33	Bottom	
R30	Bottom	
R27	Bottom	
R29	Bottom	

OUTPUT SIGNALS & FLOW RATE	
Please record the following information with the output signal wires disconnected:	
Velocity Output (+) - (-):	mA / VDC
Estimated Flow:	FPM / CFM / MPS / LPS

NULL & ½ SCALE CHECK	
Set all DIP switches to the ON position while the transmitter is powered On and record the following measurement:	
Velocity Output (+) - (-):	mA / VDC
Set all DIP switches to the OFF position while the transmitter is powered On and record the following measurement:	
Velocity Output (+) - (-):	mA / VDC

