Advantage III

Gold Series by Ebtron

Installation Guide

GTL108

“Plug & Play” Transmitter with Lonworks Network Output

Document Name: IG_GTL108_R1A
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1 GTL108 TRANSMITTER INSTALLATION

This document provides only the instructions necessary to install the GTL108 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 Installation, Operation and Maintenance technical manual TM_GTx108 under separate cover. The GTL108 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. Install transmitter upright and in a field accessible location. The enclosure accepts 1/2 in. (12.7 mm) electrical fittings for signal and power wiring at both sides at the top of the enclosure.

Locate the transmitter so that the connecting cables from all of the sensor probes will reach the receptacles on the bottom of the transmitter enclosure.

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

⚠️ Leave unobstructed space of at least 9 in. (228.6 mm) above, 2 in. (50.8 mm) to each side and 3.5 in. (88.9 mm) below the transmitter to allow for cover removal, sensor connections and heat dissipation.

⚠️ 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.

1.1 GTL108 Mechanical Dimensions

![Figure 1. GTL108 Mechanical Dimensions](image)
2 GTL108 TRANSMITTER INTERIOR VIEW/FEATURES

![Diagram of GTL108 Interior](image)

**Table 1. GTx108 Connectivity Options**

<table>
<thead>
<tr>
<th>Output to Host Controls</th>
<th>Output/Protocols Supported</th>
<th>Airflow</th>
<th>Temperature</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combination Analog / RS-485</td>
<td>Analog: Linear 0-5VDC / 0-10VDC or 4-20mA</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Model GT108</td>
<td>RS-485: BACnet®-MS/TP, Modbus-RTU</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td><strong>Lonworks Output Card</strong> P.N. 800-5030</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Combination Analog / Ethernet</td>
<td>Analog: Linear 0-5VDC / 0-10VDC or 4-20mA</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Model GTM108</td>
<td>BACnet Ethernet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BACnet-IP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Modbus-TCP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TCP/IP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LonWorks® - Model GTL108</td>
<td>Free Topology Transceiver</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
3  GTL108 TRANSMITTER POWER AND PROBE CONNECTIONS

3.1 Power Transformer Selection

Select a 24 VAC transformer based on the maximum power requirements indicated on the transmitter label (16 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.

NOTE

In order to retain the GTx108 device CE marking, GTx108 transmitters must be powered by a transformer that also carries the CE mark.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>13</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>13</td>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>14</td>
<td>8</td>
<td>16</td>
</tr>
</tbody>
</table>

3.2 Connecting Power to the Transmitter

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 (Figure 3). Since the output signals are isolated from the power supply, it is not necessary to provide an isolated (secondary not grounded) power source.

⚠️ Multiple GTL108 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 3. Connecting Power to the Transmitter

Power Fuse
Replace with UL® listed, 1.5 amp, fast acting only
P.N. 800-1115 (10 pack)

24 VAC Input Power
22.8 to 26.4 VAC
20 VA max.

L2
L1
3.3 Connecting Sensor Probes to the Transmitter

After installing the sensor probes and transmitter, connect each of the sensor probe cable plugs to the circular receptacles located at the bottom of the GTL108 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 accept only GF2 sensors. For fan array applications, sensors must be connected in the specific order shown in Figure 6 to ensure that proper parameters (area, number of sensors, etc.) are entered during set up.

⚠️ 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 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.

⚠️ When traverse data is desired (especially when using the EB-Link Reader), probes should be installed and connected to the transmitter using the mounting convention specified in Figures 6, 7 and Table 3. Proper installation simplifies sensor location decoding during data analysis.

![Figure 4. Type B and Type C Transmitter Connector Panel Detail](image)

![Figure 5. Connector Detail](image)
3.3.1 Sensor Addressing and Probe Positioning

Sensors are automatically addressed after power is applied to the transmitter as shown in Figure 6 and detailed in the following paragraphs:

**Figure 6. Sensor Addressing Detail**

**Type ‘B’ (4 Connector) Transmitters**

The probe that is connected to the left-most used receptacle (labeled C1-C4) on the transmitter is addressed as **probe 1**. Up to 4 sensors can be individually viewed. To standardize installation and decoding of the data, EBTRON suggests the sensor probe mounting convention as shown in Figure 7 and Table 3.

**Type ‘C’ (8 Connector) Transmitters**

Probes are statically numbered. The probe that is connected to the upper row and left-most receptacle (labeled C1) on the transmitter is addressed as **probe 1**. Up to 8 sensors can be individually viewed. To standardize installation and decoding of the data, EBTRON recommends the sensor probe mounting convention as shown in Figure 7 and Table 3 as viewed from fan inlet.

When a probe is disconnected and then plugged in to a different port, the transmitter will re-discover it within 15 seconds and make any necessary addressing adjustments.

For fan arrays, the fan information provided is specific to the numbered connector.

### Table 3. Suggested Sensor Configurations (for Traverse decoding and EB-Link Data)

<table>
<thead>
<tr>
<th>PROBE#</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONNECTOR#</td>
<td>C1</td>
<td>C2</td>
<td>C3</td>
<td>C4</td>
<td>C5</td>
<td>C6</td>
<td>C7</td>
<td>C8</td>
</tr>
<tr>
<td>ORIENTATION</td>
<td>Left</td>
<td>Right</td>
<td>Left</td>
<td>Right</td>
<td>Left</td>
<td>Right</td>
<td>Left</td>
<td>Right</td>
</tr>
<tr>
<td>MODEL NUMBER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FAN NUMBER (see diagram on previous page)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** The probe numbering and suggested fan numbering convention and transmitter connections facilitates and enhances the FAN ALARM feature and use of the optional EB-Link Interface and reader.
SINGLE WIDTH SINGLE INLET (SWSI) AND DOUBLE WIDTH DOUBLE INLET (DWDI) - SUGGESTED SENSOR CONFIGURATIONS

SWSI FANS

<table>
<thead>
<tr>
<th>Left</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>C2</td>
</tr>
</tbody>
</table>

DWDI FANS

<table>
<thead>
<tr>
<th>Left</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>C2</td>
</tr>
</tbody>
</table>

FAN ARRAYS - SUGGESTED SENSOR CONFIGURATIONS

Refer to Fan Arrays Suggested Sensor Mounting Configurations of Table 3.

Figure 7. Suggested Sensor Configurations (for Traverse decoding and EB-Link Data)
4 GTL108 LONWORKS NETWORK CONNECTIONS

4.1 GTL108 LonWorks Overview

The GTL108 includes a full featured LonWorks® compatible interface. The EBTRON LonWorks output card (part number 800-5030) plugs directly onto the GTL108 main circuit board as shown below. It includes a high speed FTT-10A, 78k baud free topology transceiver interface that is relatively insensitive to network wiring topology. The GTL108 may be preconfigured using the EBTRON_108.XIF file available for download at: http://www.ebtron.com/downloads/EBTRON_108.XIF, or configured at installation via direct LonWorks® parameter upload from the GTL108 transmitter. A service push-button and LED are provided for standard installation. A “Wink” LED is provided for easy device identification. An “Activity” LED and separate transmit and receive “TX” and “RX” provide visual indication of transmitter and communication status. The “Activity” LED normally flashes on for 1 second, off for 1 second when the card is commissioned and online, and remains illuminated constantly if there is an error.

4.2 GTL108 LonWorks Connections

Connect the transmitter output to the LonWorks bus in a "daisy-chain" configuration using approved LonWorks cable. The transmitter provides an output that is isolated from the main power input. 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 network cables to terminals 1 and 2 (only) at the three position terminal block labeled “OUTPUT” on the upper left hand side of the main circuit board as shown in Figure 8 and in the Wiring Diagram of Appendix A.

![Figure 8. GTL108 LonWorks Network Wiring Detail](image-url)
4.3 GTL108 - VELOCITY AND FLOW VARIABLES CONFIGURATION

This section details the air flow and air velocity variables and how the configuration properties relate to them.

4.3.1 Velocity and Flow Variables

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>SNVT</th>
<th>Measurement</th>
<th>Type Category</th>
<th>Type Resolution</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>nvoAirVel</td>
<td>SNVT_speed_mil</td>
<td>Linear Velocity</td>
<td>Unsigned Long</td>
<td>0.001</td>
<td>m/s</td>
</tr>
<tr>
<td>nvoAirFlow</td>
<td>SNVT_flow</td>
<td>Flow Volume</td>
<td>Unsigned Long</td>
<td>1</td>
<td>l/s</td>
</tr>
<tr>
<td>nvoAirFlowF1</td>
<td>SNVT_flow_fl</td>
<td>Flow Volume</td>
<td>Floating Point</td>
<td>n/a</td>
<td>l/s</td>
</tr>
<tr>
<td>nvoAirFlow1</td>
<td>SNVT_flow</td>
<td>Flow Volume</td>
<td>Unsigned Long</td>
<td>1</td>
<td>l/s</td>
</tr>
<tr>
<td>nvoAirFlow2</td>
<td>SNVT_flow</td>
<td>Flow Volume</td>
<td>Unsigned Long</td>
<td>1</td>
<td>l/s</td>
</tr>
<tr>
<td>nvoAirFlow3</td>
<td>SNVT_flow</td>
<td>Flow Volume</td>
<td>Unsigned Long</td>
<td>1</td>
<td>l/s</td>
</tr>
<tr>
<td>nvoAirFlow4</td>
<td>SNVT_flow</td>
<td>Flow Volume</td>
<td>Unsigned Long</td>
<td>1</td>
<td>l/s</td>
</tr>
<tr>
<td>nvoAirFlow5</td>
<td>SNVT_flow</td>
<td>Flow Volume</td>
<td>Unsigned Long</td>
<td>1</td>
<td>l/s</td>
</tr>
<tr>
<td>nvoAirFlow6</td>
<td>SNVT_flow</td>
<td>Flow Volume</td>
<td>Unsigned Long</td>
<td>1</td>
<td>l/s</td>
</tr>
<tr>
<td>nvoAirFlow7</td>
<td>SNVT_flow</td>
<td>Flow Volume</td>
<td>Unsigned Long</td>
<td>1</td>
<td>l/s</td>
</tr>
<tr>
<td>nvoAirFlow8</td>
<td>SNVT_flow</td>
<td>Flow Volume</td>
<td>Unsigned Long</td>
<td>1</td>
<td>l/s</td>
</tr>
</tbody>
</table>

**nvoAirVel (SNVT_speed_mil - Air Velocity)**
This variable provides simple linear airflow in meters/second.

**nvoAirFlow (SNVT_flow - Airflow)**
This variable provides volumetric airflow in liters/sec.

**nvoAirFlowF1 (SNVT_flow_f - Airflow Float)**
This variable provides volumetric airflow in liters/sec.

**nvoAirFlow1-8 (SNVT_flow - Airflow)**
These variables provide volumetric airflow for fans 1-8.

4.3.2 Velocity and Flow Configuration Properties

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>SNP</th>
<th>Measurement</th>
<th>Type Category</th>
<th>Type Resolution</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>nvoAirVel</td>
<td>SCPTmaxSendTime</td>
<td>Time</td>
<td>Signed Long</td>
<td>0.1</td>
<td>Seconds</td>
</tr>
<tr>
<td>nvoAirVel</td>
<td>SCPTminSendTime</td>
<td>Time</td>
<td>Signed Long</td>
<td>0.1</td>
<td>Seconds</td>
</tr>
<tr>
<td>nvoAirVel</td>
<td>SCPTminDelta</td>
<td>Linear Velocity</td>
<td>Unsigned Long</td>
<td>0.001</td>
<td>m/s</td>
</tr>
</tbody>
</table>

**nvoAirVel (SCPTmaxSendTime - Maximum Time Between Updates)**
This configuration property sets the maximum time to elapse between updates to the network for velocity and flow to occur.

**nvoAirVel (SCPTminSendTime - Minimum Time Before Updates)**
This configuration property sets the minimum time to elapse before an update to the network for velocity and flow may be sent. This configuration property takes priority over maxSendTime and sndDelta.

**nvoAirVel (SCPTsndDelta - Minimum Change for Update)**
This configuration property sets the minimum change in velocity that will cause an update of flow and velocity to the network. The change is only checked for in velocity, and when the minimum is reached updates will occur for nvoVel, nvoFlow, and nvoFlowFl.
4.3.3 Temperature Variables and Configuration Properties
This section details the temperature variable and how the configuration properties that relate to it.

Table 6. GTL108 LonWorks Node Temperature Variable

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>SNVT</th>
<th>Measurement</th>
<th>Type Category</th>
<th>Type Resolution</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>nvoTemp</td>
<td>SNVT_temp_p</td>
<td>Temperature</td>
<td>Signed Long</td>
<td>0.01</td>
<td>Degrees C</td>
</tr>
<tr>
<td>nvoTemp1</td>
<td>SNVT_temp_p</td>
<td>Temperature</td>
<td>Signed Long</td>
<td>0.01</td>
<td>Degrees C</td>
</tr>
<tr>
<td>nvoTemp2</td>
<td>SNVT_temp_p</td>
<td>Temperature</td>
<td>Signed Long</td>
<td>0.01</td>
<td>Degrees C</td>
</tr>
<tr>
<td>nvoTemp3</td>
<td>SNVT_temp_p</td>
<td>Temperature</td>
<td>Signed Long</td>
<td>0.01</td>
<td>Degrees C</td>
</tr>
<tr>
<td>nvoTemp4</td>
<td>SNVT_temp_p</td>
<td>Temperature</td>
<td>Signed Long</td>
<td>0.01</td>
<td>Degrees C</td>
</tr>
<tr>
<td>nvoTemp5</td>
<td>SNVT_temp_p</td>
<td>Temperature</td>
<td>Signed Long</td>
<td>0.01</td>
<td>Degrees C</td>
</tr>
<tr>
<td>nvoTemp6</td>
<td>SNVT_temp_p</td>
<td>Temperature</td>
<td>Signed Long</td>
<td>0.01</td>
<td>Degrees C</td>
</tr>
<tr>
<td>nvoTemp7</td>
<td>SNVT_temp_p</td>
<td>Temperature</td>
<td>Signed Long</td>
<td>0.01</td>
<td>Degrees C</td>
</tr>
<tr>
<td>nvoTemp8</td>
<td>SNVT_temp_p</td>
<td>Temperature</td>
<td>Signed Long</td>
<td>0.01</td>
<td>Degrees C</td>
</tr>
</tbody>
</table>

*nvoTemp (SNVT_temp_p - Temperature Variable)*
This network variable provides temperature in degrees Celsius.

*nvoTemp1-8 (SNVT_temp_p)*
These variables provide temperature for fans 1-8.

4.3.4 Temperature Configuration Properties

Table 7. GTL108 LonWorks Node Temperature Configuration Variable

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Configuration Property</th>
<th>Type</th>
<th>Type Category</th>
<th>Type Resolution</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>nvoTemp</td>
<td>SCPTmaxSendTime</td>
<td>Time</td>
<td>Signed Long</td>
<td>0.1</td>
<td>Seconds</td>
</tr>
<tr>
<td>nvoTemp</td>
<td>SCPTminDeltaTemp</td>
<td>Temperature</td>
<td>Signed Long</td>
<td>0.001</td>
<td>Degrees C</td>
</tr>
<tr>
<td>nvoTemp</td>
<td>SCPTminSendTime</td>
<td>Time</td>
<td>Signed Long</td>
<td>0.01</td>
<td>Seconds</td>
</tr>
</tbody>
</table>

*nvoTemp (SCPTmaxSendTime - Maximum Time Between Updates)*
This configuration property sets the maximum time to elapse between updates to the network for temperature to occur.

*nvoTemp (SCPTminDeltaTemp - Minimum Change for Update)*
This configuration property sets the minimum change in temperature that will cause an update of nvoTemp to the network.

*nvoTemp (SCPTminSendTime - Minimum Time Before Updates)*
This configuration property sets the minimum time to elapse before an update to the network for temperature may be sent. This configuration property takes priority over maxSendTime and minDeltaTemp.

4.4 GTL108 LONWORKS DEFAULT DELTA VALUES
The default Delta values determine when updates are sent from the transmitter to the network. The factory default Delta values are set to a large enough value to prevent any undesired messages from being sent to the network. Refer to the preceding paragraphs for description and configuration of the Delta values.
5  GTL108 TRANSMITTER START UP, INITIALIZATION AND SETUP MENUS

To ensure a successful start-up, verify that the airflow measuring station sensor probes and transmitter are installed in accordance with EBTRON guidelines.

⚠️ Check the physical installation, power connections and model specific 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 that takes 10 seconds to complete, and then enters initialization and the Setup Wizard menu if that has not been completed.

5.1 Transmitter Initialization and Setup Menus

The GTx108-F Transmitter automatically initializes at power-up and conducts full system diagnostics. At the first start-up (and until the Setup Wizard is completed), the system will initiate a Setup Wizard that guides the user through the setup of the transmitter. When completed, the Setup Wizard will store all values entered. If not completed, the Setup Wizard will again restart at the next power-up of the transmitter. Navigate through the menus as shown in Appendix B.

5.2 Changing the System of Units - IP or SI Units

The GTL108 transmitter is provided with the system of units set to IP. To change to SI units, simultaneously press and release the “ENT” and “ESC” buttons during normal operation. “IP/SI UNITS” will be indicated on the LCD display. Refer to Appendix A SYSTEM OF UNITS MENU for details on the System of Units menu. Note that Setup Menu items are shown in IP System Of Units. When SI System of Units is selected, the units of measure abbreviations used in the menus is as shown below.

Table 8. Standard “IP” and “SI” Menu Units Abbreviations

<table>
<thead>
<tr>
<th>“IP” System of Units</th>
<th>Description</th>
<th>“SI” System of Units</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FPM</td>
<td>Feet per minute</td>
<td>MPS</td>
<td>Meters per second</td>
</tr>
<tr>
<td>CFM</td>
<td>Cubic feet per minute</td>
<td>LPS</td>
<td>Liters per second</td>
</tr>
<tr>
<td>SQF</td>
<td>Square feet</td>
<td>SQM</td>
<td>Square meters</td>
</tr>
<tr>
<td>F</td>
<td>Fahrenheit</td>
<td>C</td>
<td>Celsius</td>
</tr>
</tbody>
</table>

5.3 GTL108 Transmitter Calibration

The GTL108 uses high quality industrial grade components and is designed for years of trouble-free operation. Periodic recalibration of the transmitter is neither required or recommended. Transmitter field calibration verifiers are available for purchase from EBTRON for installations requiring periodic validation of instrumentation. Contact EBTRON for more information.

5.4 GTL108 LCD Display Notifications

Following a brief initialization at power up, the LCD display automatically displays airflow and temperature with units of measurement in all upper case (caps) characters. The display provides additional information on system status and alarm conditions. Refer to the ALARM FEATURES section of this manual for additional detail on Alarm and Trouble Error code indications.
5.5 Factory Default Menu Settings for GF2 Fan inlet Sensors

The GTL108 transmitter is “plug and play” and does not require setup unless a network option is selected that requires configuration. Table 9 shows the factory default settings for GF2 sensors.

To change the Factory Default Settings, see: CHANGING FACTORY DEFAULT SETUP MENU SETTINGS.

Table 9. Factory Default Menu Settings

<table>
<thead>
<tr>
<th>Display</th>
<th>Description</th>
<th>I-P</th>
<th>S.I.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIRFLOW*</td>
<td>Airflow measurement method, Actual or Standard.</td>
<td>ACT</td>
<td>ACT</td>
</tr>
<tr>
<td><em>LCDU/M</em></td>
<td>Airflow units of measure</td>
<td>ACFM</td>
<td>LPS</td>
</tr>
<tr>
<td><em>AREA</em></td>
<td>Free area where station is located (required for volumetric measurement)</td>
<td>0.00 sq.ft. (see note)</td>
<td>0.000 sq.meters (see note)</td>
</tr>
<tr>
<td><em>LLIMIT</em></td>
<td>Low limit cutoff</td>
<td>0 AFPM</td>
<td>0 MPS</td>
</tr>
<tr>
<td><em>FLOW ADJ</em></td>
<td>Offset-Gain On/Off</td>
<td>Off</td>
<td>Off</td>
</tr>
<tr>
<td><em>GAIN</em></td>
<td>Gain factor</td>
<td>1.000</td>
<td>1.000</td>
</tr>
<tr>
<td><em>OFF</em></td>
<td>Offset factor</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td><em>TEMP METH</em></td>
<td>Temperature Averaging</td>
<td>Weighted Avg.</td>
<td>Weighted Avg.</td>
</tr>
<tr>
<td><em>LCD INTG</em></td>
<td>Number of flow calculations to be averaged for LCD display.</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td><em>EB-LK INT</em></td>
<td>Number of flow calculations to be averaged for EB-Link readings.</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td><em>ALT</em></td>
<td>Altitude for flow correction relative to mean sea level (0 ft)</td>
<td>0 ft</td>
<td>0 m</td>
</tr>
<tr>
<td><em>SETPNT</em></td>
<td>Alarm setpoint value. Operates in conjunction with <em>TOL</em> value.</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><em>TOL</em></td>
<td>Alarm range tolerance value. This setting establishes the alarm range relative to the <em>SETPNT</em> value.</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td><em>DELAY</em></td>
<td>Time that the alarm condition must exist before alarm output is activated.</td>
<td>2 minutes</td>
<td>2 minutes</td>
</tr>
<tr>
<td><em>ZERO OFF</em></td>
<td>Set to YES to inhibit LO alarm condition when flow reading is zero (dependent on <em>LLIMIT</em> setting). Set to NO to disable this feature.</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td><em>RESET</em></td>
<td>Set to AUTO to have alarm self-clear when alarm condition no longer exists. Set to MANUAL to require manual reset of alarm.</td>
<td>AUTO</td>
<td>AUTO</td>
</tr>
</tbody>
</table>

Note: Area is entered during setup using SETUP WIZARD.

5.6 GTL108 Changing Factory Default Setup Menu Settings

5.6.1 Setup Menu Options

The GTL108 Transmitter is setup and tested at the factory to be fully operational when sensor probes are connected and power is applied (set the power switch to the “ON” position). Factory settings can easily be changed using the SETUP MENU by simultaneously pressing and releasing the “UP” and “DOWN” buttons while the transmitter is in its normal operating mode. Appendix A details the SETUP menus. Navigate through the SETUP menus to make changes to the transmitter configuration. The settings take effect immediately. The following are common field modifications to the factory default settings.

5.6.2 Selecting Actual and Standard Output Measurement Type

The transmitter is set from the factory to provide actual airflow measurement units (displayed as “ACFM” and “AFPM”). In this mode, airflow measurements are calculated for actual inlet conditions. If using Actual conditions, corrections for altitude are entered through the ALT= setting in the Setup menu. If desired, the output can be set to provide standard airflow measurement units (displayed as “SCFM” and “SFM”) which provides measurements that are corrected to standard conditions.

5.6.3 Changing the LCD Display from Volumetric Flow CFM to Velocity FPM

The GTL108 transmitter is shipped from the factory to indicate volumetric flow. To display velocity in FPM, enter the SETUP menu and in the DISPLAY submenu, change the “*LCD UM=ACFM” to “*LCD UM=AFPM”.
5.6.4 Locking the Configuration Settings
The GTL108 transmitter configuration settings can be locked at one of three security levels within the SECURITY submenu using the LOCK SEC item.

When LOW security level is selected (LOCK SEC=LOW) the last 4 digits of the board serial number are automatically assigned as the lock code. To see the board serial number, navigate to DIAGNOSTICS menu in SERIAL NUMBERS item.

When the MED security level is selected (LOCK SEC=MED) the user enters a security code. In the event that this code is lost/misplaced, EBTRON can provide a key that is unique to the transmitter to unlock it. Contact EBTRON customer service for this code.

When the HIGH security level is selected (LOCK SEC=HIGH) the user enters a security code. In the event that this code is lost/misplaced, the transmitter must be returned to the factory in order to unlock it.

⚠️ When LOCK SEC=HIGH is selected, the user defined setting can only be changed after entering the user defined code. STORE THE LOCK CODE IN A SAFE LOCATION! For security reasons, the HIGH level lock code can only be reset by returning the transmitter to the factory.

6 SETUP MENUS
Appendix A details the various setup menus and submenus.

7 WIRING DIAGRAM
Appendix B is the wiring diagram for the GTL108 transmitter.
APPENDIX A - ADVANTAGE 3 -
FAN ARRAY FAN INLET SENSOR SETUP MENUS

SETUP WIZARD
Launched at initial power-up, and if Setup Wizard was not completed.

- To SET AREA METH

- VISIBLE FOR ARRAY ONLY, FANS=1 to 8 (SWSI; DWDI=1)

- VISIBLE FOR ARRAY ONLY IF DISTR=EQUAL

- VISIBLE FOR ARRAY ONLY IF DISTR=VAR

- ARRAY only

- Enter area
- Enter diameter where probes are located

- ARRAY only, if AREAS=VAR
- ARRAY only, if AREAS=VAR

- SETUP COMPLETE!

- SETUP COMPLETE!

- SETUP COMPLETE!

- SETUP COMPLETE!
SYSTEM OF UNITS MENU
Simultaneously depress/release ENTER + ESC keys during normal operation to select

<table>
<thead>
<tr>
<th>* Factory Default/Current Setting</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enter (move ←)</td>
<td>* Factory Default/Current Setting</td>
</tr>
<tr>
<td>Enter (move →)</td>
<td>Enter (move ←)</td>
</tr>
<tr>
<td>Esc (normal oper.)</td>
<td>Esc (normal oper.)</td>
</tr>
<tr>
<td>Esc (move ← or prev setting)</td>
<td>Esc (move ← or prev setting)</td>
</tr>
</tbody>
</table>

ACTION
- Set system of units to I-P (FPM, CFM, sq.ft., ºF)
- Set system of units to S.I. (MPS, LPS, sq.M., ºC)

NOTE:
Changing IP/SI SYS resets alarm settings and scaling values.

SETUP MENU
Simultaneously depress/release ↑ + ↓ keys during normal operation to select

<table>
<thead>
<tr>
<th>DISPLAY</th>
<th>LCD INTG=100</th>
<th>LCD TRBL=OFF</th>
<th>LCD TRBL=On</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCD UM=ACFM</td>
<td>LCD UM+CFPM</td>
<td>LCD UM+ACFM</td>
<td>LCD UM+ACFM</td>
</tr>
<tr>
<td>LCD Displays</td>
<td>Custom LCD Flow Text</td>
<td>Custom LCD Display Text</td>
<td>Custom LCD Display Text</td>
</tr>
</tbody>
</table>

TO PART 5 'A' TO PART 2
**Gold Series GTL108 Transmitter**

**FROM PART 1**

- Analog cards only
  - If AO1 Signal = mA
    - AO1 Assign = FLOW
    - AO1 Assign Fixed
    - Set SW1 on PCB
  - If AO1 Signal = VDC
    - AO1 Range = 0-10V
    - Set AO1 Range?
    - AO1 Range = 0-5V
  - AO1 UM = AFPM
- AO1 RNGE = 0-10
  - AO1 FS = 10000
  - Set AO1 FS?
  - AO1 FS = 10000
  - AO1 UNITS FIXED
  - AO1 UM = AFPM
  - AO1 INTG = 30
  - Set AO1 INTG?
  - AO1 INTG = 30
  - AO1 CFG = TEMP
  - Set AO1 CFG?
  - AO1 CFG = TEMP
  - AO1 CFG = ALRM, FA or TRBL
  - Set NO FAULT = HI
  - Set NO FAULT?
  - NO FAULT = HI

**TO PART 3**

- Analog cards only
  - If AO2 Signal = mA
    - AO2 Assign = FLOW
    - AO2 Assign Fixed
    - Set SW1 on PCB
  - If AO2 Signal = VDC
    - AO2 Range = 0-10V
    - Set AO2 Range?
    - AO2 Range = 0-5V
  - AO2 UM = AFPM
  - AO2 RNGE = FIXED
  - AO2 RNGE = 0-10
  - AO2 FS = 160
  - AO2 ASGN = F
  - AO2 UNITS FIXED
  - AO2 UM = AFPM
  - AO2 CFG = TEMP
  - AO2 CFG = ALRM, FA or TRBL
  - SET AO2 CFG = FA or TRBL
FROM PART 2

**GTC only**

- **NETWORK**
  - *NETOUT+GTCNT*
  - SET NETOUT?
  - NETOUT+GTCNT

  - *NETADDR=127*
  - SET NETADDR?
  - NETADDR=127

  - NETBAUD=7880
  - SET NETBAUD?
  - NETBAUD=7880

  - Option for MODBUS only
    - *PARITY=EVEN*
    - SET PARITY?
    - PARITY=EVEN

  - Option for BACNET only
    - *NETDI=2*
    - SET NETDI?
    - NETDI=2

**GTM only**

- **NETWORK**
  - *DHCP=OFF*
  - SET DHCP?
  - DHCP=OFF

  - *IP=10.0.0.1*
  - SET IP?
  - IP=10.0.0.1

  - *MASK=255.255.255.0*
  - SET MASK?
  - MASK=255.255.255.0

  - *GATE=10.0.0.1*
  - SET GATEWAY?
  - GATE=10.0.0.1

  - *BACNET=IP*
  - SET BACNET?
  - BACNET=IP

  - Option for MODBUS only
    - *PARITY=EVEN*
    - SET PARITY?
    - PARITY=EVEN

  - Option for BACNET only
    - *NETDI=2*
    - SET NETDI?
    - NETDI=2

TO PART 4

**GTC configuration**

- Set network protocol type.
- Enter network address.
- Set network baud rate.

**GTM configuration**

- Set network protocol type.
- Set network device instance number.
- Set network IP?
- Set network netaddress?
- Set network netout?

**EB-Link integration samples.**
**GOLD SERIES GTL108 TRANSMITTER**

**FROM PART 3**

- **ALARM OFF**
  - LO ALRM=OFF
  - HI ALRM=OFF
  - ALRM UM=AFPM
  - SET SETPNT
  - TOL=10%
  - DELAY=2 min
  - ZERO OFF=NO
  - RESET=AUTO

- **ALARM ON**
  - LO ALRM=ON
  - HI ALRM=ON
  - ALRM UM=AFPM
  - SET SETPNT
  - TOL=10%
  - DELAY=2 min
  - ZERO OFF=NO
  - RESET=AUTO

**TO PART 5 'B'**

- **FAN ALARM TYPE**
  - FA TYPE=NONE
  - FA TYPE=MIN
  - FA TYPE=DEVI
  - FA TYPE=%MAX

**Setting Instructions**

- **Enable/disable LO alarm.**
- **Enable/disable HI alarm.**
- **Set alarm units of measure to FPM or CFM (Note: A if ACT or S if STD measurement prefix set by AIRFLOW= setting above).**
- **Enter setpoint for alarm.**
- **Enter tolerance as value above or below alarm setpoint. Units based on ALARM UM.**
- **Set alarm DELAY.**
- **When ZERO OFF=YES, this setting is used to inhibit the LO ALRM condition when the unit is reading 0. This is dependent on the low limit setting.**
- **Set alarm RESET. AUTO will clear once the alarm is not active. MANUAL requires user to clear alarm by depressing the ESC key, or for RS485 (GTC108) output, write 0 to corresponding alarm BACnet object or Modbus register. Alarm will only clear when alarm is not active.**

**Alarm Settings**

- **Alarm on absolute minimum Fan velocity value.**
- **Alarm on % deviation from median of all fans.**
- **Alarm on % deviation from maximum velocity of individual fan.**
- **This setting determines whether a fan that is in an alarm condition should be removed from the average.**
**Gold Series GTL108 Transmitter**

**FROM PART 1 TO PART 6**

- **Adjustments**: Enables/disables flow adjustments.
- **Gain = 1.000**
- **Offset = 0**
- **Ensure that fan is on and set to desired speed**
- **Gain = 1.000**
- **Offset = 0**
- **Run Setup Wizard**
  - Intialize setup wizard. See setup wizard at beginning of setup menus.
- **Output Test 1**
  - Set OUT1 to % of full scale analog output.
- **Output Test 2**
  - Set OUT2 to % of full scale analog output.
- **Field Adjust**
  - Run FA Wizard
  - Initiate setup wizard.
- **Security**
  - Sets security level to Low. In this mode, there is no prompt for a lock code. The last 4 digits of the board serial are used to unlock.
  - Sets security level to Med. In this mode, a user defined code is specified. In the event of loss of code, contact EBTRON for a unique code for this transmitter to unlock and reset code.
  - Sets security level to High. In this mode, a user defined code is specified. In the event of loss of code, transmitter must be returned to EBTRON for unlock/reset.
- **Reset**
  - Reset all changes back to factory defaults. Transmitter resets after completion.
  - Reset sensor data. Transmitter resets after completion.
  - Reset flow adjustments to GAIN = 1, OFF = 0, FLOW ADJ = OFF.
  - Resets network settings to factory default.

**Dashed lines indicate Menus when # of Flows > 2**

*Wait. . .% ADJUSTMENT COMPLETE*

- Adjustments
- Ensure that fan is on and set to desired speed!
- FLOW1 = 0 (Set 0 to 99999 using the "<" key)
- FLOW2 = 0 (Set 0 to 99999 using the "<" key)

**Tools**

- **Run Setup Wizard**
  - ARE YOU SURE?
  - RUN SET WIZ=NO
  - RUN SET WIZ=YES*

**Setup wizard**

- **Set OUT1 TEST%**
  - SET OUT1 TEST?
  - OUT1 TEST%=0

**Output Test**

- **Set OUT2 TEST%**
  - SET OUT2 TEST?
  - OUT2 TEST%=0

**Field Adjust Wizard**

- **Start field adjust wizard and enter number of integration samples to use.**

**Setup wizard**

- **Enable/Disable flow adjustments.**
- **Enter gain applied to airflow reading.**
- **Enter offset applied to airflow reading.**
- **Start field adjust wizard and enter number of integration samples to use.**

**Security**

- **Set security level to Low. In this mode, there is no prompt for a lock code. The last 4 digits of the board serial are used to unlock.**
- **Set security level to Med. In this mode, a user defined code is specified. In the event of loss of code, contact EBTRON for a unique code for this transmitter to unlock and reset code.**
- **Set security level to High. In this mode, a user defined code is specified. In the event of loss of code, transmitter must be returned to EBTRON for unlock/reset.**

**Reset**

- **Reset all changes back to factory defaults. Transmitter resets after completion.**
- **Reset sensor data. Transmitter resets after completion.**
- **Reset FLOW adjustments to GAIN = 1, OFF = 0, FLOW ADJ = OFF.**
- **Resets network settings to factory default.**

"Wait. . .% ADJUSTMENT COMPLETE" when adjustment is complete. If you wish to review the adjustment made, simply navigate back to the Setup menu and view the Adjustments section.

If you wish to review the adjustment made, simply navigate back to the Setup menu and view the Adjustments section.
GOLD SERIES GTL108 TRANSMITTER

FROM PART 5

1: NO PROBES
(example shown)

Displays unit serial number.

1=#####CFM
For fan arrays only; Fans 1 to 8.
For sensors 1 to 8

Type C board only

Displays probe serial numbers followed by a T if connected and functioning properly, and then followed by an F if not connected or not functioning properly.

Displays unit serial number.

Displays main PCB serial number.

Note: On 8 connector board only

SENS TEMP
For sensors 1 to 8

SENS VELOCITY
For sensors 1 to 8

SENS VOLTS
For sensors 1 to 8

FAN VELOCITY
For fans 1 to 8

FAN VOLUME
For fans 1 to 8.

Note that spurious trouble codes may self-clear during normal operation, and this feature permits viewing them even after they have resolved.

Set DSBL TRBL= YES to ignore currently displayed TRBL alarm. To disable all trouble codes, see SETUP -> DISPLAY -> LCD TRBL.

Displays historical list of last 5 trouble codes encountered and their descriptions.

Displays active trouble codes and their descriptions. Contact EBTRON customer service for recommended service information.
APPENDIX B -
GTL108 WIRING DIAGRAM

NOTES:
1. REFER TO LonWorks® FTT-10A Free Topology Transceiver User’s Guide AVAILABLE AT www.echelon.com FOR LONWORKS® NETWORK WIRING SPECIFICATIONS AND TERMINATION REQUIREMENTS.
2. GTL108 CONNECTIONS AT TERMINALS 1 AND 2 (NET + and NET -) ARE NOT POLARITY SENSITIVE, AND THE COM CONNECTION IS NOT USED.
3. ON MULTIPLE GTL108 TRANSMITTER INSTALLATIONS WITH A COMMON 24VAC SOURCE, WIRE 24 VAC CONNECTIONS IN-PHASE TO THE SAME TERMINALS ON ALL TRANSMITTERS (e.g.: L1 to L1, L2 to L2).