Installation, Operation and Maintenance Technical Manual

IAQ-200-N

Relative Humidity and Temperature Sensor for RS-485 BACnet® and Modbus® RTU Applications

Model: IAQ-200-N
Part Number: 410-5300AB

Document: TM_IAQ-200-N_R1A

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LIST OF EFFECTIVE AND CHANGED PAGES

Insert latest changed pages (in bold text); remove and dispose of superseded pages.
Total number of pages in this manual is **18.**

Page	Rev *	Description of Change	Date
1-18	R1A	Initial Document Release	06/18/2010

* R1A indicates an original page without change

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Figure 1. *EBTRON* IAQ-200 - RH/Temperature Wall Mount BACnet®/Modbus® RTU Sensor

OVERVIEW

EBTRON's IAQ-200-N is an innovative wall mount relative humidity (RH)/temperature sensor that provides precision measurement and BACnet® MS/TP or Modbus® RTU communications interface in a single device packaged for interoperability with modern building automation systems (BAS).

The integral RS-485 BACnet® MS/TP and Modbus® RTU compatible communications interface includes options for setting address, device instance and baud rate. Coupled with complementary precision relative humidity and temperature sensors, the IAQ-200 provides an economical, simple and intelligent alternative to harnessing and coordinating the network operation of individual relative humidity and temperature sensor devices.

Simple field configuration is accomplished by DIP switches on the main circuit board and via the BACnet® and Modbus® RTU interface.

ADVANCED TECHNOLOGY

- Single BACnet®/Modbus® RTU device features integrated complement of precision sensing elements for Relative Humidity and Temperature measurement.
- Integral RS-485 BACnet® MS/TP and Modbus® RTU interface for interoperability with common BAS devices.
- Microprocessor-based electronics with industrial grade integrated circuits.
- Convenient DIP switch user interface for simple field configuration.

Network Connectivity Solutions

BACnet®

Modbus®

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SPECIFICATIONS

Sensor Complement
- Advanced precision sensing elements for relative humidity and temperature measurement via RS-485 BACnet® MS/TP and Modbus® RTU communication interface

Relative Humidity Sensor Performance
- Technology: Planar Capacitive Polymer
- RH Range: 0 to 100% RH, non condensing
- RH Accuracy: ±2% @ 20% to 80% RH, 77°F (25°C)
  ±3%: <20% to >80% RH, 77°F (25°C)
- RH Resolution: 0.4% RH

Temperature Sensor Performance
- Technology: Integral band gap PTAT
- Range: –58°F to 302°F (–50°C to 150°C)
- Accuracy: ±1.08°F at 77°F (±0.6°C at 25°C)
- Resolution: 0.36°F (0.2°C)

Signal Processing: Microprocessor-based

Power Supply Performance
- Technology: Integral power supply powered by external 24 VAC (22.8-26.4VAC), 50/60 Hz source.
- Brownout Watchdog protection reset circuit
- Overvoltage, overcurrent, and surge protection

Enclosure
- Attractive low profile wall mount enclosure compatible with standard single-gang electrical box, and surface mount applications.

Dimensions
- 4.650 x 3.250 x 1.090 in (118.11 x 82.55 x 27.69 mm)

User Interface
- Simple DIP switch selection

Output to Host Controls
- RS-485 BACnet® MS/TP or Modbus® RTU
- Baud rate: Selectable 76,800, 38,400, 19,200, 9,600
  Default: RS-485 BACnet® MS/TP 76,800
  Default: Modbus® RTU: 19,200

System Diagnostics
- On board LED status indicator

Environmental Limits
- Operating Temperature: 32° F to 122° F
  (0° C to 50° C)
- Moisture: 0 to 95% RH, noncondensing

Limited Warranty
- 36 months from shipment - refer to ***EBTRON*** "Standard Terms and Conditions of Sale" for complete warranty information.

ORDERING GUIDE

Order ***EBTRON*** model number **IAQ-200-N**.

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IAQ-200 PLACEMENT CONSIDERATIONS

Figure 2 details the mechanical outline dimensions of the IAQ-200. The location selected for the IAQ-200 is important to ensure accurate readings that are representative of the area to be monitored. Preferred mounting locations are:

- On an interior wall that has no direct sunlight exposure and is near (but not directly in the airstream of) a return air duct. In areas with multiple return air ducts, locate the sensor at a point between them, observing the same precautions. Avoid areas with poor air circulation, such as behind doors or in alcoves where temperature fluctuations and moisture accumulation can affect sensor performance. Also, avoid areas such as those located adjacent to water coolers, coffee machines, etc.
- At a height of 4 to 6 feet from floor level, and at least 3 feet from a corner and 2 feet from an open doorway.
- Away from the direct airflow of windows, doorways, halls or other heating and cooling sources.
- Away from other equipment that could affect the temperature of the sensor.

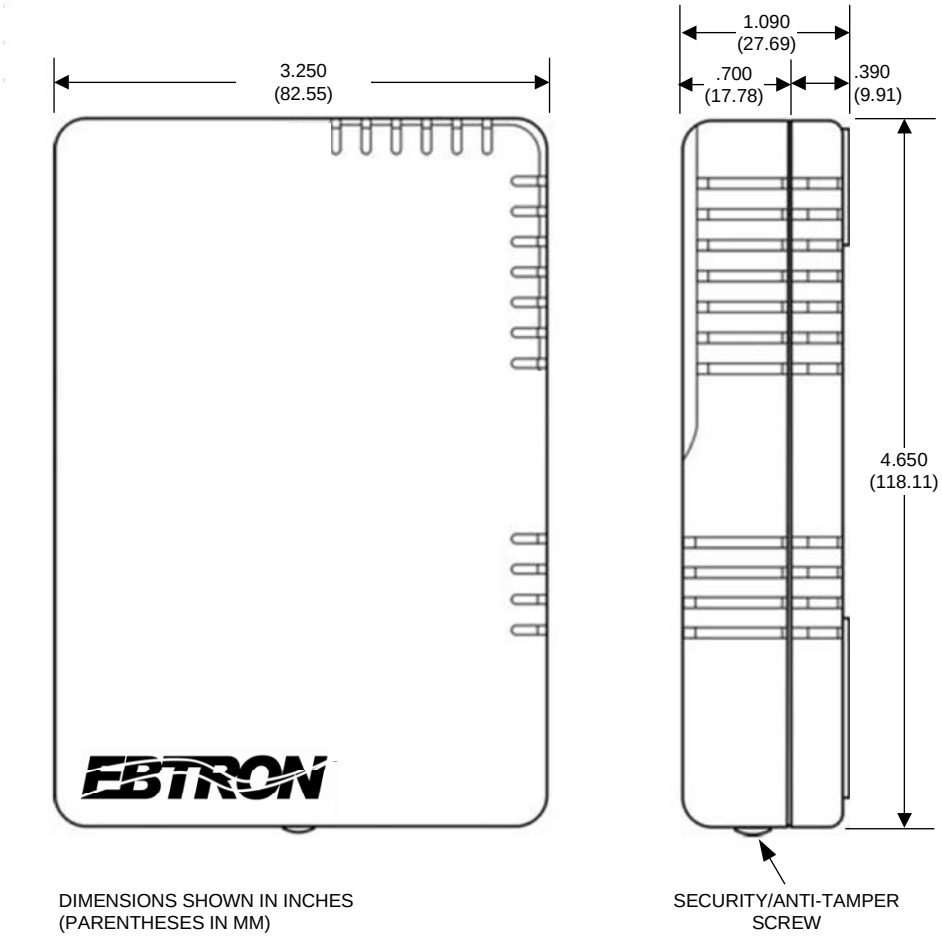

Figure 2. IAQ-200 Outline Dimensions

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IAQ-200 INSTALLATION

Read and understand all installation instructions prior to installing the IAQ-200. The IAQ-200 is designed for surface mount installation, or for installation onto a standard (field supplied) single gang electrical junction box. Installation and wiring of the IAQ-200 must be accomplished in accordance with all local electrical and mechanical codes to ensure safety and compliance. Refer to Figure 2 for IAQ-200 outline dimensions, and Figure 3 for mounting hole locations.

CAUTION

Deactivate 24 VAC power source until all connections to the IAQ-200 are complete.

When multiple devices are powered from a common 24VAC power source, ensure that all devices are wired in phase with 24VAC power at L1, and 24VAC return at L2! Damage will occur to the IAQ-200 and/or other devices if this caution is not observed.

The IAQ-200 contains electrostatic discharge (ESD) sensitive components. To prevent damage, observe ESD precautions when handling the instrument. Failure to comply can result in equipment damage.

The installed location of the IAQ-200 is critical for proper performance. Refer to the previous IAQ-200 PLACEMENT CONSIDERATIONS section of this document for additional recommendations.

Ensure that adequate clearance exists to permit installation and wiring of the IAQ-200, and to allow for access to the board mounted instrument configuration switches.

1. Carefully open the IAQ-200 package and inspect for damage. If any damage is noted, immediately file a claim with carrier.
2. Determine the IAQ-200 installation location as indicated on the engineer's plans, or determine placement using the previous guidelines.
3. Install IAQ-200 wiring to the desired location, observing the previous placement considerations. Wiring may be routed directly through wall for surface mounting of the IAQ-200, or may be brought through a junction box depending upon local requirements. All wiring must be accomplished in accordance with local regulations and national codes.
4. Carefully remove the cover of the IAQ-200. Depress the enclosure tab at the bottom of the enclosure, and swing the cover upward to disengage it from the base. The IAQ-200 includes two mounting screws for standard electrical junction box installations, and one security/tamper resistant screw to secure the cover. After IAQ-200 installation and configuration is complete, this screw may be installed at the bottom of the enclosure to prevent inadvertent or unauthorized opening of the enclosure.
5. Using the IAQ-200 base as a template, mark the location for the wiring pass-through slot and for the mounting screws as shown in Figure 3. For mounting directly to a single-gang electrical junction box, proceed to step 8.
6. Drill holes sized for suitable wall anchors at the mounting locations marked, and install the wall anchors.
7. Drill another hole suitable to pass the IAQ-200 wiring through the wall at the marked wiring pass-through slot location. Pull wiring through hole, and allow 6 inches for wiring of the IAQ-200.
8. Pass IAQ-200 wiring through the rear pass-through opening of the IAQ-200 base and mount the instrument at the desired location using appropriate hardware for the mounting method selected. Refer to the proceeding sections of this document for initial instrument set up and normal operation.

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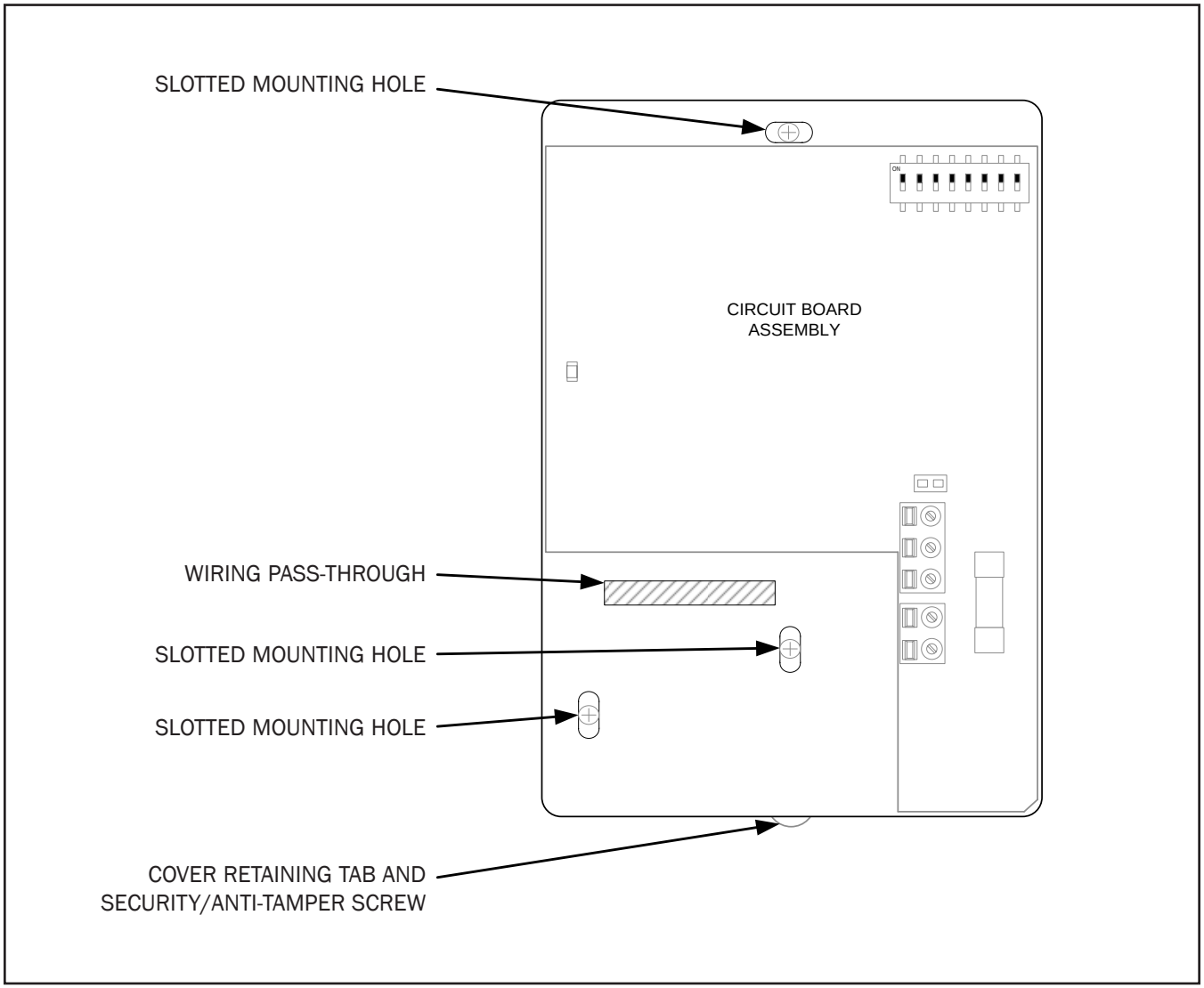

Figure 3. Marking Locations for Installation

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IAQ-200 INTERCONNECTIONS

CAUTION

⚠ Deactivate 24 VAC power source until all connections to the IAQ-200 are complete.

⚠ When multiple devices are powered from a common 24VAC power source, ensure that all devices are wired in phase with 24VAC power at L1, and 24VAC return at L2! Damage will occur to the IAQ-200 and/or other devices if this caution is not observed.

⚠ The IAQ-200 contains electrostatic discharge (ESD) sensitive components. Observe ESD precautions when handling the instrument to prevent damage. Failure to comply can result in equipment damage.

All connections are accomplished on the IAQ-200 circuit board at terminal blocks J2 and J3, shown in Figures 4 and 5.

1. Connect 24VAC power to the IAQ-200 at terminal block J3 terminals L1 and L2. When powering multiple network devices from a common source, observe 24VAC phasing (24VAC to L1, return at L2 - see Caution above).

2. The L2 post of the 24VAC J3 terminal block can be connected to earth ground according to the following:

CAUTION

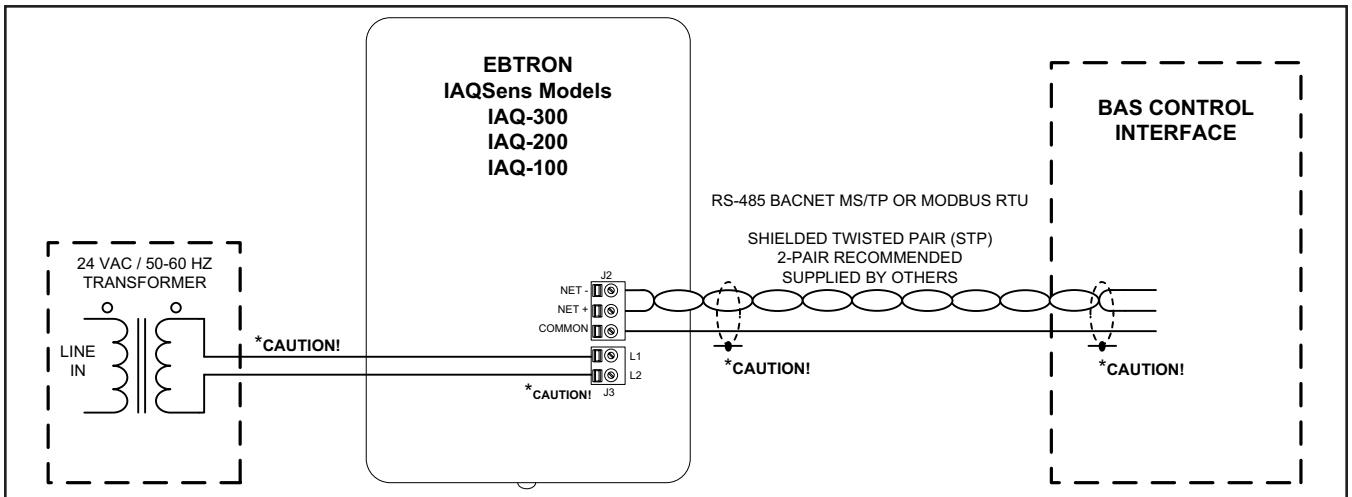
Damage to network devices may occur if L2 of the 24VAC J3 terminal block is connected to earth ground and the RS485 network is not earth grounded.

a) If the RS485 network connection for the IAQ-200 is ground referenced to earth, the L2 post of the 24VAC J3 terminal block can also be connected to a wire that is ground referenced to earth.

b) If the RS485 network connection for the IAQ-200 is not ground referenced to earth, then the L2 post of the 24VAC J3 terminal block must not be connected to a wire ground referenced to earth, as damage to other network devices may occur.

3. Connect the RS485 network connections at terminal block J2 as follows:

J2 Terminal Block	Network Connection
-	NET -
+	NET +
COM	NETWORK COMMON



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*** CAUTION!**

When multiple devices are powered from a common 24VAC power source, ensure that all devices are wired in phase with 24VAC power at L1, and 24VAC return at L2! Damage will occur to the IAQSens device and/or other devices if this caution is not observed.

On RS-485 networks that are ground referenced to earth, IAQSens terminal L2 **may** also be connected to a wire ground referenced to earth. However, on RS-485 networks that are **not** ground referenced to earth, terminal L2 **must not** be connected to a wire ground referenced to earth. Damage may occur to the IAQSens or other network devices if this caution is not observed.

Figure 4. IAQ-200 Typical Wiring Diagram to BAS Control Interface

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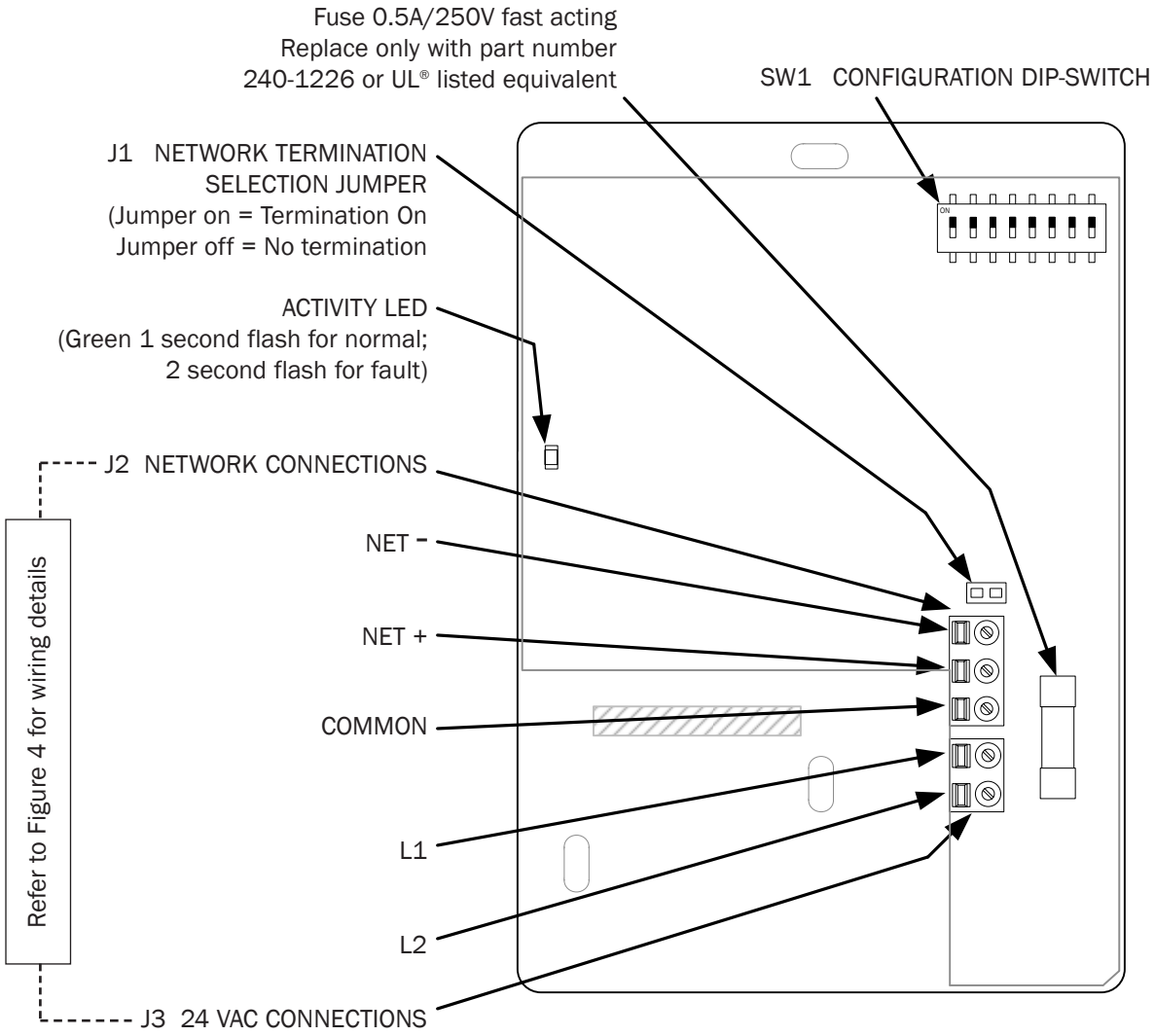

CAUTION

When multiple devices are powered from a common 24VAC power source, ensure that all devices are wired in phase with 24VAC power at L1, and 24VAC return at L2! Damage will occur to the IAQ-200 and/or other devices if this caution is not observed.

Figure 5. IAQ-200 Interior Detail View

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IAQ-200 SET UP

The IAQ-200 is shipped from the factory for BACnet® operation. If Modbus® operation is desired, proceed to the **IAQ-200 MODBUS® CONFIGURATION** section of this document.

IAQ-200 BACnet® CONFIGURATION

The following paragraphs detail the initial set up instructions for the IAQ-200 when using BACnet® device operation. Refer to Appendix A - IAQ-200 BACnet® Device Operating Parameters for a detailed listing of all BACnet® network variables and values.

J1 - IAQ-200 RS485 Network Termination Selection

The IAQ-200 includes a network termination selection jumper at J1 (shown in Figure 4) to permit device installation at any point on an RS-485 network. When the IAQ-200 is located at either end of an RS-485 network or segment, it is recommended that the jumper at J1 be installed across both pins of J1. When the IAQ-200 is located at any other point on the RS-485 network, no termination is recommended, and the jumper should not be installed across J1.

Setting IAQ-200 Time

It is not necessary to set the internal clock within the Model IAQ-200 prior to placing the device in operation, or in the event of loss of power to the instrument.

Note:

When initially powered on (or following an interruption of 24 VAC power), the IAQ-200 internal time is set at 00:00:00 (midnight).

Although not necessary, the IAQ-200 time setting may be re-synchronized with the network following a power loss or interruption. For BACnet® applications, a timesync command (see Appendix A) may be sent to the IAQ-200 using appropriate network software. For Modbus® applications, the current time (in hours and minutes) may be reset using appropriate network software at registers 30013 and 30014 respectively (see Appendix B).

SW1 - IAQ-200 Configuration DIP Switch Settings

The configuration DIP switch contains eight separate dual-position switches in a dual inline package (DIP) as shown in Figures 5 and 6. These switches allow for setting the following IAQ-200 network parameters:

- Setting the MAC Address/Slave ID - using Switches 1 through 7
- Setting BACnet® Device Object Instance Number (if the same as the MAC Address) - using Switch 8
- Setting BACnet® Baud Rate - using Switches 1 through 4
- Restoring Defaults - using Switches 1-8
- Enabling Modbus® network operation - using Switches 1 through 4

NOTE:

Prior to initializing the IAQ-200, the MAC address and the baud rate parameters must be assigned.

The following paragraphs provide detail for setting the network parameters using Configuration DIP Switch SW1.

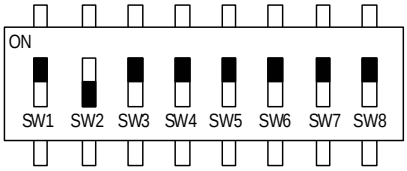

Figure 6. SW1 - Configuration DIP Switch Detail View

Setting the MAC Address

The default IAQ-200 MAC Address is set at the factory for a value of 2. If it is necessary to change the MAC address use switches 1 through 7 of SW1 to set the MAC Address to set any network address between 1 and 127 as follows:

1. Deactivate 24VAC power to the IAQ-200.
2. Set SW1 switches 1-7 to the desired address as shown in Figure 7. Record the new MAC address value for future reference.
3. Reapply 24VAC power to the IAQ-200. After a short delay (approximately 20 seconds) the new MAC address is now active.

MAC ADDRESS SETTINGS

SW1 DIP Switches 1-7

DIP Switch Number and Position								Network
1	2	3	4	5	6	7	8	Address
off	off	off	off	off	off	off	off	0
on	off	off	off	off	off	off	off	1
off	on	off	off	off	off	off	off	2
on	on	off	off	off	off	off	off	3
⬇	⬇	⬇	⬇	⬇	⬇	⬇	off	⬇
on	on	on	on	on	on	on	off	127

Only SW1 Switches 1 through 7 are used to set the MAC Address - See text for detail.

Figure 7. MAC Address Selection Settings

NOTE:

When IAQ-200 configuration is completed, confirm that the new MAC address has been set correctly using appropriate BACnet® software

Changing BACnet® Device Object Instance Number

The BACnet® Device Object Instance Number is set at the factory to match the factory default address of 2. If necessary, the BACnet® Device Object Instance Number can be set to match the user assigned MAC address as follows:

1. Deactivate 24VAC power to the IAQ-200.
2. Slide DIP Switch 8 to the ON position.
3. Restore 24VAC power to the IAQ-200. Allow a short delay (approximately 20 seconds) for the new BACnet® Device Object Instance Number to be recognized.
4. Restore DIP Switch 8 to the OFF position.

The BACnet® Device Object Instance Number can also be set to another value that does not match the MAC address by using suitable BACnet® software to write to the Device Object Identifier property of the Device Object. Refer to Appendix A for additional detail.

Setting the MS/TP Baud Rate

The IAQ-200 is shipped from the factory for BACnet® operation with a baud rate of 76,800bps. The baud rate can be changed to 38,400, 19,200 or 9,600bps. Changes can be accomplished remotely over the network using BACnet® Analog Value AV1 (Table A3), or locally at the IAQ-200 by using internal DIP Switch SW1 as follows:

1. Record the currently assigned MAC Address (SW1 switches 1 through 7 - See Figure 7).
2. Set the desired baud rate using Address Switches 1 through 4 as shown in Figure 8.

Baud Rate Selection

SW1 DIP Switches 1-4

ADDRESS DIP Switch Number/Position								MS/TP
1	2	3	4	5	6	7	8	Baud Rate
on	off	off	off	X	X	X	X	76,800
off	on	off	off	X	X	X	X	38,400
off	off	on	off	X	X	X	X	19,200
off	off	off	on	X	X	X	X	9,600

Only SW1 Switches 1 through 4 are used to set the Baud Rate - See text for detail.

Figure 8. Baud Rate Selection Settings

3. Set DIP Switch 8 to the ON position. Allow a short delay (approximately 20 seconds) for the new baud rate to be recognized.
4. Restore DIP Switch 8 to the OFF position.
5. Restore DIP switches 1-7 to the MAC address recorded in step 1.

Restoring Factory Default Settings

The following procedure can be used to restore the factory default settings to the IAQ-200:

1. If the current MAC Address will be reused, record the currently assigned address (SW1 switches 1 through 7 - see Figure 7).
2. Deactivate 24VAC power to the IAQ-200.
3. Set all 8 of the DIP switches (1-8) to the ON position.
4. Restore 24VAC power to the IAQ-200. Allow a short delay (approximately 20 seconds) for the factory default settings to be recognized.
5. Deactivate 24VAC power to the IAQ-200.
6. Set all 8 of the DIP switches (1-8) to the OFF position.
7. Restore DIP switches 1-7 to the MAC address recorded in step 1.
8. Restore 24VAC power to the IAQ-200 to return it to service with factory default settings.

IAQ-200 MODBUS® CONFIGURATION

The IAQ-200 is preset at the factory for BACnet® network operation. To set the IAQ-200 for Modbus® network operation, perform the following steps. Refer to Appendix B - IAQ-200 MODBUS® Device Operating Parameters for a detailed listing of Modbus® network register values and settings.

1. The default network address is set at the factory for a value of 2. Any value between 1 and 127 can be assigned for the IAQ-200 using Configuration DIP Switch SW1 as outlined in the **Setting the MAC Address** paragraph of this document. If the current network address will be reused, record the current settings of DIP switches 1 through 7.
2. With the IAQ-200 powered on, set Configuration DIP switches 1 through 4 to the ON position.
3. Toggle DIP switch 8 to the ON position for 5 seconds, and then back to OFF.

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4. Restore DIP switches 1-7 to the network address recorded in step 1.
5. The IAQ-200 is now set for Modbus® operation with a baud rate of 19,200bps. If necessary, the baud rate can be changed as outlined previously in the **Setting the Baud Rate** paragraph of this document.
6. Configure the necessary Modbus® register values as outlined in Appendix B.

IAQ-200 START-UP

The following procedure is intended for initial start up of the instrument.

1. Confirm that the IAQ-200 is installed and wired properly as outlined in **IAQ-200 INSTALLATION** and IAQ-200 **INTERCONNECTIONS** sections of this document.
2. Confirm that network termination, address, baud rate and device object instance number (as applicable) have all been properly set as outlined previously in the **IAQ-200 BACnet® CONFIGURATION** or **IAQ-200 MODBUS® CONFIGURATION** sections of this document.
3. Apply 24VAC power to the IAQ-200. After a brief initialization (approximately 20 seconds) observe that the green Activity LED flashes on for 1 second, then OFF for one second indicating normal operation.
4. Install IAQ-200 cover by engaging the small molded hinges at the top of the cover with the base, and then gently swinging the cover downward into the closed position. The cover will latch via the tab located at the bottom of the enclosure. If required, install Security/Tamper resist screw at the bottom of the IAQ-200 enclosure (as shown in Figure 3).
5. Confirm network device settings and operation using Appendices A and B for BACnet® and Modbus® applications respectively.
6. The IAQ-200 is now ready for normal network operation.

IAQ-200 NORMAL OPERATION

During normal operation of the IAQ-200, no further user activity is required.

The IAQ-200 features a green “Activity” light emitting diode (LED - see Figure 5) that flashes to indicate the operating status of the instrument. Following application of 24VAC power and a brief instrument initialization of approximately 20 seconds, the LED will begin to flash.

During normal IAQ-200 operation the Activity LED will continuously flash ON for 1 second, then OFF for 1 second.

During IAQ-200 fault conditions, the LED will continuously flash ON for 2 seconds, and then OFF for 2 seconds.

Refer to Appendix A and Appendix B for BACnet® and Modbus® device network values available during operation of the IAQ-200.

IAQ-200 MAINTENANCE

In most HVAC environments, periodic maintenance and calibration are not required or recommended.

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EBTRON STANDARD LIMITED PARTS WARRANTY

If any ***EBTRON*** product fails within 36 months from shipment, ***EBTRON*** will repair/replace the device free of charge as described in the company’s warranty contained in ***EBTRON***’s Terms and Conditions of Sale. Defective equipment shall be shipped back to ***EBTRON***, freight pre-paid, for analysis.

APPENDIX A - BACnet® NETWORK DEVICE OPERATING PARAMETERS

IAQ-200 BACNET® OVERVIEW

The BACnet® objects associated with the IAQ-200 permit display of current values and device configuration. The BACnet® object categories for the IAQ-200 (below) are described in the following paragraphs.

BACnet® Device Object
BACnet® Analog Input (AI) Objects
BACnet® Analog Value (AV) Objects
BACnet® Binary Value Objects

BACnet® Device Object

The device object allows configuration of the IAQ-200. Object properties can be specified as shown in Table A1.

Table A1. BACnet® Device Object

BACnet® Object	Description
IAQ-200-N	This object allows the operator to specify the following: Device name Device location Time and Date Universal Time Coordinated Offset APDU properties MS/TP properties Object Identifier

BACnet® Analog Input (AI) Objects

The analog input BACnet® objects permit display of the present values for the items detailed in Table A2. In addition, analog input change of value (AI COV) subscriptions for these objects can be configured as follows:

AI COV: A confirmed or unconfirmed COV (Change of Value) notification can be subscribed to for each analog input object (below). The COV increment value can be set through each AI.

Table A2. BACnet® Analog Input (AI) Objects

BACnet® Object	Default Present-Value	Range	Description
RH (AI1)	Display Only	NA	Displays the present value of relative humidity in percent.
Temperature (AI2)	Display Only	NA	Displays the present value of ambient room temperature in degrees F (can be changed to degrees C if desired).

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BACnet® Analog Value Objects

The analog value BACnet® objects allow for configuration of variables that affect instrument operation and individual sensor measurement accuracy.

Table A3. BACnet® Analog Value Objects

BACnet® Object	Default Present-Value	Range	Description
Baud Rate (AV1)	76,800	Optional	This object allows specifying the RS485 Baud rate.
Relative Humidity Gain (AV2)	1	0 - 100	This object allows specifying a gain to the raw Relative Humidity sensor reading or to the EBTRON factory calibration gain adjustment setting.
Temperature Gain (AV3)	1	0 - 100	This object allows specifying a gain to raw Temperature sensor reading or to the EBTRON factory calibration gain adjustment setting.
Relative Humidity Offset (AV4)	0	+/-100	This object allows specifying an offset to raw Relative Humidity sensor reading or to the EBTRON factory calibration offset adjustment setting.
Temperature Offset (AV5)	0	+/-200	This object allows specifying an offset to raw Temperature sensor reading or to the EBTRON factory calibration offset adjustment setting.

BACnet® Binary Value Objects

The binary value BACnet® objects allow for application of the EBTRON factory calibration values for individual sensor gain and offset factors.

APPENDIX B - MODBUS® NETWORK DEVICE OPERATING PARAMETERS

Table A4. BACnet® Binary Value Objects

BACnet® Object	Default Present-Value	Range	Description
Factory Relative Humidity Gain/Offset Status (BV1)	Active	Active/ Inactive	When this object is set to Active, the Relative Humidity sensor will operate with the EBTRON factory calibration values for gain and offset.
Factory Temperature Gain/Offset Status (BV2)	Active	Active/ Inactive	When this object is set to Active, the Temperature sensor will operate with the EBTRON factory calibration values for gain and offset.

IAQ-200 Modbus® Register Overview

The Modbus® registers associated with the IAQ-200 permit display of current values and device configuration. They are grouped into the following categories:

Read-only registers consisting of three 4-byte floats (high word/low word) detailed in Table B2.
Read/write registers consisting of seven 4-byte floats (high word/low word) detailed in Table B3.
Read/write 2-byte registers detailed in Table B4.

Table B1 identifies the IAQ-200 supported standard Modbus® command functions.

Table B1. IAQ-200 Supported Standard Modbus® Command Functions

Command	Description
04	Read input registers (refer to Tables B2 through B4).
06	Write registers (refer to Tables B2 through B4).
16	Write multiple registers (refer to Tables B2 through B4).

Modbus® 4-Byte Floats - Read Only Properties

The 4-byte floats with read only properties permit display of each of the sensors values in the IAQ-200 as detailed in Table B2.

Modbus® 4-Byte Floats - Read/Write Properties

Table B2. Modbus® 4-Byte Floats - Read-Only Properties

Name	Address	Default Register Value	Range	Description
Present Relative Humidity	30001 - 30002	Display Only	NA	These paired registers contain the present relative humidity percentage.
Present Temperature	30003 - 30004	Display Only	NA	These paired registers contain the present ambient room temperature in degrees F.

The 4-byte floats with read and write properties detailed in Table B3 allow the configuration of gain and offset variables that affect the measurement accuracy of the sensors.

Modbus® 2-Byte Registers - Read/Write Properties

The 2-byte registers with read and write properties detailed in Table B4 allow configuration of the variables that affect the accuracy of the sensors.

Table B3. Modbus® 4-Byte Floats - Read/Write Properties

Name	Address	Default Register Value	Range	Description
Relative Humidity Gain	30005 - 30006	1	0 - 100	These paired registers allow specifying a gain value to the raw Relative Humidity sensor reading or to the EBTRON factory gain adjustment setting.
Temperature Gain	30007 - 30008	1	0 - 100	These paired registers allow specifying a gain value to the raw Temperature sensor reading or to the EBTRON factory gain adjustment setting.
Relative Humidity Offset	30009 - 30010	0	+/-100	These paired registers allow specifying an offset value to the raw Relative Humidity sensor reading or to the EBTRON factory offset adjustment setting.
Temperature Offset	30011 - 30012	0	+/-200	These paired registers allow specifying an offset value to the raw Temperature sensor reading or to the EBTRON factory offset adjustment setting.

Table B4. Modbus® 2-Byte Registers - Read/Write Properties

Name	Address	Default Register Value	Range	Description
IAQ-200 Time: Hours	30013	0	0 - 23	This register allows setting the current hour of time.
IAQ-200 Time: Minutes	30014	0	0 - 59	This register allows setting the current minute of time.
Float Invert	30015	0	0 or 1	This register allows change to the order of register that is read or written first in the 4-byte floats. When this register is set to 0 (default) the high word is read or written first; when it is set to 1 the low word is read or written first.
Factory Relative Humidity Gain/Offset Status	30016	1	1 or 0	When this register is set to 1 (default) the Relative Humidity sensor operates with EBTRON factory gain and offset adjustment. When this register is set to 0, the Relative Humidity sensor operates without factory gain and offset adjustment.
Factory Temperature Gain/Offset Status	30017	1	1 or 0	When this register is set to 1 (default) the Temperature sensor operates with EBTRON factory gain and offset adjustment. When this register is set to 0, the Temperature sensor operates without EBTRON factory gain and offset adjustment.
Temperature Units of Measurement Units	30018	0	0 or 1	This register allows setting the temperature measurement units of register 30003/30004 to Fahrenheit or Celsius. When this register is set to 0 (default) the unit of temperature measurement is Fahrenheit. When set to 1, the unit of temperature measurement is Celsius.

TM_IAQ-200-N_R1A

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Thermal Dispersion Airflow Measurement

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