

# TEC260x-2 Series Network Thermostat Protocol Implementation Conformance Statement

Technical Bulletin

TEC260x-2

Code No. LIT-12011185

Software Release 2.1

Issued June 23, 2006

---

<b>Document Introduction</b> .....	<b>3</b>
<b>Annex A - Protocol Implementation Conformance Statement (Normative)</b> .....	<b>4</b>
Product Description .....	4
BACnet Standardized Device Profile (Annex L) .....	4
Segmentation Capability .....	4
Standard Object Types Supported .....	5
Analog Input .....	6
Analog Value .....	6
Binary Input .....	6
Binary Value .....	6
Device .....	6
Group .....	6
Multistate Value .....	7
Data Link Layer Option .....	7
Device Address Binding .....	7
Networking Options .....	7
Character Sets Supported .....	8
Objects Table .....	8
<b>Annex K - BACnet Interoperability Building Blocks (BIBBs) (Normative)</b> .....	<b>11</b>



# **TEC260x-2 Series Network Thermostat Protocol Implementation Conformance Statement Technical Bulletin**

## **Document Introduction**

This document contains the Protocol Implementation Conformance Statement (PICS) and BACnet® Interoperability Building Blocks (BIBBs) for the Network Thermostat as required by the American National Standards Institute/American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ANSI/ASHRAE) Standard 135-2004, BACnet protocol.

The PICS is a written document created by the manufacturer of a device to identify the particular options specified in the BACnet standard and implemented in the device.

BACnet Interoperability Building Blocks are collections of one or more BACnet services. This document includes a listing of the BIBBs currently supported by the Network Thermostat.

## Annex A - Protocol Implementation Conformance Statement (Normative)

**Table 1: BACnet Protocol Implementation Conformance Statement**

Date	January 3, 2006
Vendor Name	Johnson Controls, Inc.
Product Name	TEC260x-2 Series Thermostat
Product Model Numbers	TEC2601-2, TEC2602-2, TEC2603-2, TEC2604-2
Applications Software Version	Not Applicable
Firmware Version	2.1.01
BACnet Protocol Revision	Version 1, Revision 2

### Product Description

The TEC260x-2 Series BACnet communicating thermostats are for heating and cooling equipment specifically designed to be monitored on a BACnet Master-Slave/Token-Passing (MS/TP) network.

### BACnet Standardized Device Profile (Annex L)

- BACnet Operator Workstation (B-OWS)
- BACnet Building Controller (B-BC)
- BACnet Advanced Application Controller (B-AAC)
- BACnet Application Specific Controller (B-ASC)
- BACnet Smart Sensor (B-SS)
- BACnet Smart Actuator (B-SA)

Note: For a complete listing of the additional BIBBs supported (Annex K), see the *Annex K - BACnet Interoperability Building Blocks (BIBBs) (Normative)* section of this document.

### Segmentation Capability

- Segmentation Requests Supported      Window Size      127
- Segmentation Responses Supported      Window Size      127

## Standard Object Types Supported

The following is a list of the standard object types as defined by ASHRAE. See the section of the supported object type for details.

- Analog Input
- Analog Output
- Analog Value
- Averaging
- Binary Input
- Binary Output
- Binary Value
- Calendar
- Command
- Device
- Event Enrollment
- File
- Group
- Life Safety Point
- Life Safety Zone
- Loop
- Multistate Input
- Multistate Output
- Multistate Value
- Notification Class
- Program
- Schedule
- Trend Log

## Analog Input

**Table 2: Analog Input**

Dynamically Creatable	Dynamically Deletable	Optional Properties Supported	Writable Properties
<input type="checkbox"/>	<input type="checkbox"/>	Reliability	Out of Service

## Analog Value

**Table 3: Analog Value**

Dynamically Creatable	Dynamically Deletable	Optional Properties Supported	Writable Properties
<input type="checkbox"/>	<input type="checkbox"/>	Reliability	Object Name <sup>1</sup> Out of Service <sup>2</sup> Present Value <sup>3</sup>

1. Object Name is writable for Room Temperature (AV6) and Outdoor Temperature (AV8).
2. Out of Service is writable for every Analog Value object except PI Heating Demand (AV18), PI Cooling Demand (AV19), and Economizer Output (AV20).
3. Present Value is writable for every Analog Value object except PI Heating Demand (AV18), PI Cooling Demand (AV19), and Economizer Output (AV20).

## Binary Input

**Table 4: Binary Input**

Dynamically Creatable	Dynamically Deletable	Optional Properties Supported	Writable Properties
<input type="checkbox"/>	<input type="checkbox"/>	Active Text Inactive Text Reliability	Out of Service

## Binary Value

**Table 5: Binary Value**

Dynamically Creatable	Dynamically Deletable	Optional Properties Supported	Writable Properties
<input type="checkbox"/>	<input type="checkbox"/>	Active Text Inactive Text Reliability	Out of Service Present Value

## Device

**Table 6: Device**

Dynamically Creatable	Dynamically Deletable	Optional Properties Supported	Writable Properties
<input type="checkbox"/>	<input type="checkbox"/>	Max Info Frames Max Master	Max Master Object Identifier Object Name

## Group

**Table 7: Group**

Dynamically Creatable	Dynamically Deletable	Optional Properties Supported	Writable Properties
<input type="checkbox"/>	<input type="checkbox"/>	N/A	N/A

## Multistate Value

**Table 8: Multistate Value**

Dynamically Creatable	Dynamically Deletable	Optional Properties Supported	Writable Properties
<input type="checkbox"/>	<input type="checkbox"/>	Reliability States Text	Out of Service Present Value

## Data Link Layer Option

- BACnet Internet Protocol (IP) (Annex J)
- BACnet IP (Annex J), Foreign Device
- ISO 8802-3, Ethernet (Clause 7)
- ANSI/ATA 878.1, 2.5 MB ARCNET® network (Clause 8)
- ANSI/ATA 878.1, RS-485 ARCNET network (Clause 8), baud rates: \_\_\_\_\_
- Master-Slave/Token-Passing (MS/TP) master (Clause 9), baud rates: 9600, 19200, 38400, 76800 (Auto-detect)
- MS/TP slave (Clause 9), baud rates: \_\_\_\_\_
- Point-To-Point, EIA 232 (Clause 10), baud rates: \_\_\_\_\_
- Point-To-Point, modem (Clause 10), baud rates: \_\_\_\_\_
- LonTalk® protocol (Clause 11), medium: \_\_\_\_\_
- Other: \_\_\_\_\_

## Device Address Binding

- Yes     No    **Is static device binding supported?** (required for two-way communication between MS/TP slaves and other devices)

## Networking Options

- Router, Clause 6: \_\_\_\_\_
  - Annex H, BACnet Tunneling Router over IP
  - BACnet/IP Broadcast Management Device (BBMD)
- Does the BBMD support registrations by Foreign Devices?                       Yes                       No

## Character Sets Supported

Indicating support for multiple character sets does not imply that they can all be supported simultaneously.

- |  |   |  |
|--|---|--|
| <input checked="" type="checkbox"/> ANSI X3.4                        | <input type="checkbox"/> IBM®/Microsoft® Double-Byte Character Set (DBCS) | <input type="checkbox"/> ISO 8859-1                                |
| <input type="checkbox"/> ISO 10646 Universal Character Set-2 (UCS-2) | <input type="checkbox"/> ISO 10646 (UCS-4)                                | <input type="checkbox"/> Japanese Industrial Standard (JIS) C 6226 |

If this product is a communication gateway, describe the types of non BACnet equipment/network(s) that the gateway supports:

---



---



---



---



---

## Objects Table

**Table 9: Objects Table (Part 1 of 3)**

Object Name	Type and Instance	Object Property	Thermostat Parameter			
			TEC2601-2	TEC2603-2	TEC2604-2	TEC2602-2
<b>TEC26MM-AAA</b>  <b>MM: last two digits of model number)</b>  <b>AAA: address of device on the MS/TP network (from 4 to 127)</b>	Device 76bbb  bbb: address of device on the MS/TP network from 004 to 127	Object_Identifier (R,W)	Unique ID number of a device on a network			
		Object_Name (R,W)	Unique name of a device on a network			
		Max_Master (R,W)	Maximum master devices allowed to be part of the network			
<b>Object Name</b>	<b>Type and Instance</b>	<b>Object Property</b>	<b>TEC2601-2</b>	<b>TEC2603-2</b>	<b>TEC2604-2</b>	<b>TEC2602-2</b>
<b>Room Temperature</b>	AV 7	Present_Value (R,W)	X	X	X	X
<b>Room Temp Override</b>	BV 8	Present_Value (R,W)	X	X	X	X
<b>Outdoor Temperature</b>	AV 9	Present_Value (R,W)	X	X	X	X
<b>Outdoor Temp Override</b>	BV 10	Present_Value (R,W)	X	X	X	X
<b>Occupancy</b>	MV 11	Present_Value (R,W)	X	X	X	X
<b>System Mode HPU</b>	MV 12	Present_Value (R,W)				X
<b>System Mode RTU</b>	MV 13	Present_Value (R,W)	X	X	X	
<b>Fan Mode</b>	MV 14	Present_Value (R,W)	X	X	X	X
<b>Supply Temperature</b>	AI 15	Present_Value (R)	X	X	X	X
<b>Keypad Lockout</b>	MV 16	Present_Value (R,W)	X	X	X	X

**Table 9: Objects Table (Part 2 of 3)**

Object Name	Type and Instance	Object Property	Thermostat Parameter			
			TEC2601-2	TEC2603-2	TEC2604-2	TEC2602-2
<b>Control Output</b>	GRP 17	Present_Value (R)	X	X	X	X
<b>PI Heating Demand</b>	AV 18	Present_Value (R)	X	X	X	X
<b>PI Cooling Demand</b>	AV 19	Present_Value (R)	X	X	X	X
<b>Economizer Output</b>	AV 20	Present_Value (R)			X	
<b>Controller Status</b>	GRP 21	Present_Value (R)	X	X	X	X
<b>AUX</b>	BI 22	Present_Value (R)	X	X	X	X
<b>G Fan</b>	BI 23	Present_Value (R)	X	X	X	X
<b>Y1 Cool</b>	BI 24	Present_Value (R)	X	X	X	X
<b>Y2 Cool</b>	BI 25	Present_Value (R)		X	X	X
<b>W1 Heat</b>	BI 26	Present_Value (R)	X	X	X	X
<b>W2 Heat</b>	BI 27	Present_Value (R)		X	X	
<b>Reversing Valve</b>	BI 28	Present_Value (R)				X
<b>DI 1 Status</b>	BI 29	Present_Value (R)	X	X	X	X
<b>DI 2 Status</b>	BI 30	Present_Value (R)	X	X	X	X
<b>Controller Alarms</b>	GRP 31	Present_Value (R)	X	X	X	X
<b>Frost Alarm</b>	BI 32	Present_Value (R)	X	X	X	X
<b>Filter Alarm</b>	BI 34	Present_Value (R)	X	X	X	X
<b>Service Alarm</b>	BI 35	Present_Value (R)	X	X	X	X
<b>Temperature Setpoints</b>	GRP 36	Present_Value (R,W)	X	X	X	X
<b>Occupied Heat Setpoint</b>	AV 37	Present_Value (R,W)	X	X	X	X
<b>Occupied Cool Setpoint</b>	AV 38	Present_Value (R,W)	X	X	X	X
<b>Unoccupied Heat Setpoint</b>	AV 39	Present_Value (R,W)	X	X	X	X
<b>Unoccupied Cool Setpoint</b>	AV 40	Present_Value (R,W)	X	X	X	X
<b>General Options 1</b>	GRP 41	Present_Value (R)	X	X	X	X
<b>Temperature Scale</b>	BV 42	Present_Value (R,W)	X	X	X	X
<b>Heating Setpoint Limit</b>	AV 43	Present_Value (R,W)	X	X	X	X
<b>Cooling Setpoint Limit</b>	AV 44	Present_Value (R,W)	X	X	X	X
<b>Heating Lockout Temperature</b>	AV 45	Present_Value (R,W)	X	X	X	X
<b>Cooling Lockout Temperature</b>	AV 46	Present_Value (R,W)	X	X	X	X
<b>Deadband</b>	AV 47	Present_Value (R,W)	X	X	X	X
<b>Heating CPH</b>	MV 48	Present_Value (R,W)	X	X	X	X
<b>Cooling CPH</b>	MV 49	Present_Value (R,W)	X	X	X	X
<b>Frost Protection</b>	BV 50	Present_Value (R,W)	X	X	X	X

**Table 9: Objects Table (Part 3 of 3)**

Object Name	Type and Instance	Object Property	Thermostat Parameter			
			TEC2601-2	TEC2603-2	TEC2604-2	TEC2602-2
<b>General Options 2</b>	GRP 51	Present_Value (R)	X	X	X	X
<b>Power-up Delay</b>	AV 52	Present_Value (R,W)	X	X	X	X
<b>Temporary Occupancy Time</b>	AV 53	Present_Value (R,W)	X	X	X	X
<b>Fan Control</b>	BV 54	Present_Value (R,W)	X	X	X	X
<b>Min. On/Off Time</b>	MV 55	Present_Value (R,W)	X	X	X	X
<b>Fan Purge Delay</b>	BV 56	Present_Value (R,W)	X	X	X	X
<b>DI 1 Configuration</b>	MV 57	Present_Value (R,W)	X	X	X	X
<b>DI 2 Configuration</b>	MV 58	Present_Value (R,W)	X	X	X	X
<b>Program Options</b>	GRP 59	Present_Value (R)	X	X	X	X
<b>Aux Contact</b>	BV 60	Present_Value (R,W)	X	X	X	X
<b>Stages</b>	GRP 63	Present_Value (R)		X	X	X
<b>Heating Stages</b>	MV 64	Present_Value (R,W)		X	X	
<b>Cooling Stages</b>	MV 65	Present_Value (R,W)		X	X	
<b>Heat Pump Stages</b>	MV 66	Present_Value (R,W)				X
<b>Economizer</b>	GRP 67	Present_Value (R)			X	
<b>Economizer Changeover Setpoint</b>	AV 68	Present_Value (R,W)			X	
<b>Economizer Minimum Position</b>	AV 69	Present_Value (R,W)			X	
<b>Mechanical Cooling</b>	BV 70	Present_Value (R,W)			X	
<b>Mixed Air Setpoint</b>	AV 71	Present_Value (R,W)			X	
<b>Heat Pump</b>	GRP 72	Present_Value (R)				X
<b>High Balance Point</b>	AV 73	Present_Value (R,W)				X
<b>Low Balance Point</b>	AV 74	Present_Value (R,W)				X
<b>Comfort Mode</b>	BV 75	Present_Value (R,W)				X
<b>Reversing Valve Configuration</b>	BV 76	Present_Value (R,W)				X
<b>Compressor Interlock</b>	BV 77	Present_Value (R,W)				X

## Annex K - BACnet Interoperability Building Blocks (BIBBs) (Normative)

Table 10 lists all the BIBBs which, per ANSI/ASHRAE Standard 135-2001, could be supported by a BACnet Application Specific Controller (B-ASC). The checked BIBBs are supported by the TEC260x-2 Series controllers.

**Table 10: BACnet Application Specific Controller BIBBs Support**

Application Service (B-ASC)	Designation	Supported
Data Sharing - Read Property - B	DS-RP-B	<input checked="" type="checkbox"/>
Data Sharing - Read Property Multiple - B	DS-RPM-B	<input checked="" type="checkbox"/>
Data Sharing - Write Property - B	DS-WP-B	<input checked="" type="checkbox"/>
Device Management - Dynamic Device Binding - B	DM-DDB-B	<input checked="" type="checkbox"/>
Device Management - Dynamic Object Binding - B	DM-DOB-B	<input checked="" type="checkbox"/>
Device Management - Device Communication Control - B	DM-DCC-B	<input checked="" type="checkbox"/>

Table 11 lists all the BACnet standard application services. The checked services are supported by the TEC260x-2 Series controllers.

**Table 11: BACnet Standard Application Services Support (Part 1 of 2)**

Application Service	Initiates Requests	Executes Requests
AcknowledgeAlarm	<input type="checkbox"/>	<input type="checkbox"/>
AddListElement	<input type="checkbox"/>	<input type="checkbox"/>
AtomicReadFile	<input type="checkbox"/>	<input type="checkbox"/>
AtomicWriteFile	<input type="checkbox"/>	<input type="checkbox"/>
ConfirmedCOVNotification	<input type="checkbox"/>	<input type="checkbox"/>
ConfirmedEventNotification	<input type="checkbox"/>	<input type="checkbox"/>
ConfirmedPrivateTransfer	<input type="checkbox"/>	<input type="checkbox"/>
ConfirmedTextMessage	<input type="checkbox"/>	<input type="checkbox"/>
CreateObject	<input type="checkbox"/>	<input type="checkbox"/>
DeleteObject	<input type="checkbox"/>	<input type="checkbox"/>
DeviceCommunicationControl	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Disconnect-Connection-To-Network	<input type="checkbox"/>	<input type="checkbox"/>
Establish-Connection-To-Network	<input type="checkbox"/>	<input type="checkbox"/>
GetAlarmSummary	<input type="checkbox"/>	<input type="checkbox"/>
GetEnrollmentSummary	<input type="checkbox"/>	<input type="checkbox"/>
GetEventInformation	<input type="checkbox"/>	<input type="checkbox"/>
I-Am	<input checked="" type="checkbox"/>	<input type="checkbox"/>
I-Am-Router-To-Network	<input type="checkbox"/>	<input type="checkbox"/>
I-Could-Be-Router-To-Network	<input type="checkbox"/>	<input type="checkbox"/>
I-Have	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Initialize-Routing-Table	<input type="checkbox"/>	<input type="checkbox"/>

**Table 11: BACnet Standard Application Services Support (Part 2 of 2)**

<b>Application Service</b>	<b>Initiates Requests</b>	<b>Executes Requests</b>
Initialize-Routing-Table-Ack	<input type="checkbox"/>	<input type="checkbox"/>
LifeSafetyOperation	<input type="checkbox"/>	<input type="checkbox"/>
ReadProperty	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ReadPropertyConditional	<input type="checkbox"/>	<input type="checkbox"/>
ReadPropertyMultiple	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ReadRange	<input type="checkbox"/>	<input type="checkbox"/>
ReinitializeDevice	<input type="checkbox"/>	<input type="checkbox"/>
RemoveListElement	<input type="checkbox"/>	<input type="checkbox"/>
SubscribeCOV	<input type="checkbox"/>	<input type="checkbox"/>
SubscribeCOVProperty	<input type="checkbox"/>	<input type="checkbox"/>
TimeSynchronization	<input type="checkbox"/>	<input type="checkbox"/>
UnconfirmedCOVNotification	<input type="checkbox"/>	<input type="checkbox"/>
UnconfirmedEventNotification	<input type="checkbox"/>	<input type="checkbox"/>
UnconfirmedPrivateTransfer	<input type="checkbox"/>	<input type="checkbox"/>
UnconfirmedTextMessage	<input type="checkbox"/>	<input type="checkbox"/>
UTCTimeSynchronization	<input type="checkbox"/>	<input type="checkbox"/>
VT-Close	<input type="checkbox"/>	<input type="checkbox"/>
VT-Data	<input type="checkbox"/>	<input type="checkbox"/>
VT-Open	<input type="checkbox"/>	<input type="checkbox"/>
Who-Has	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Who-Is	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Who-Is-Router-To-Network	<input type="checkbox"/>	<input type="checkbox"/>
WriteProperty	<input type="checkbox"/>	<input checked="" type="checkbox"/>
WritePropertyMultiple	<input type="checkbox"/>	<input type="checkbox"/>



**Controls Group**  
 507 E. Michigan Street  
 Milwaukee, WI 53202

© 2006 Johnson Controls, Inc.