# HVAC Controls For System Integrators

neptronic®

# neptronic

www.neptronic.com

## Overview

Neptronic features a wide range of BTL listed BACnet MS/TP or Modbus networked controllers that have proven integration with several BMS systems on multiple sites around the world. Neptronic networkable controllers offer flexibility and simplicity within any integration strategy to provide:

- Seamless integration and interoperability
- Real-time information management and control
- Lower costs and higher value
- Diverse control strategies
- Higher energy conservation

## Save Time On Integration, Installation and Commissioning

Neptronic networkable controllers feature some or all of the following features and benefits.

**Two MAC Address Configuration Methods**

Set MAC address via user friendly menu on thermostat or locally on unit via DIP switches.

**Auto Configuration and Detection**

The controller automatically configures its device instance to a default value + MAC address. The controller automatically configures its baud rate by detecting the network speed upon connection.

**Copy Configuration**

Copy the controller's entire configuration and broadcast it to other controllers of the same type on the same network.

**BACnet Objects**

Multiple BACnet Objects per controller enable you to read/write information as you monitor and trend status of operation, alarms and schedules.

**Firmware Upgrade via BACnet**

Upgrade the device in the field via BACnet. Initiate the upgrade during normal operation and choose when to restart the system.

**Programming Schedules**

Determine occupancy in advance for 7 days with up to 6 events per day. Avoid constant monitoring and save energy.

**Automatic Update of Changed Values**

Enable subscription to update changed values automatically. Avoid regular polling of values, reduce traffic and transmit faster.

**Service Display**

If you are searching for a specific device, enabling the service mode will flash the device to easily locate the device.

**ASHRAE BACnet™**

**UMCP Frederick Hall,
Maryland (USA)**

AUTOMATEDLOGIC
United Technologies

**370 TFCB**
Wall mount controllers

**Wilson Project,
Sidney, OHIO (USA)**

**Thompson Tractor Company,
Alabster, Alabama (USA)**

BUILDINGLOGIX
BUILDING SYSTEM OPTIMIZATION

**65 EVCB**
Controllers

**International Civil Aviation Organization (ICAO),
Montreal, Quebec (Canada)**

Delta
CONTROLS
A Delta Group Company

**1100 EVCB**
Controllers

**INTEL PTK-1 R&D Center,
Petach Tikva (Israel)**

GE

**700 EFCB**
Controllers

**Rashid Hospital,
Dubai (UAE)**

Honeywell

**240 EVCB**
Controllers

**Funan Digitalife Mall,
Singapore**

Johnson Controls

**950 TUCB
450 CMMB106**
Controllers

**Google Offices Tel-Aviv,
Israel**

Schneider Electric

**700 EFCB**
Controllers

**Jurong Port,
Singapore**

Schneider Electric

**700 EVCB**
Controllers

**Landmark 81,
Vietnam**

SIEMENS

**700 EVCB**
Controllers

**Palm Tower,
Qatar**

TREND

**1600 EVCB**
Controllers

**World Business Center
Heathrow Airport London (UK)**

TRIDIUM

**200 EFCB**
Controllers

**Google Campus,
India**

TRIDIUM

**350 EVCB**
Controllers

# EFCB

## Fan Coil
### Unit Controller



Fan coil unit controller (EFCB) with Digital Room Sensor (TDF)

### Inputs

| DI4 | AI6 | ⏻ |
|---|---|---|
| **4** Digital* | **6** Analog* | **24**Vac **120/240**Vac |

### Outputs

| BO8 | AO4 | 🌀 |
|---|---|---|
| **4** TRIACs Up to **4** Digital* | **4** Analog* | **1, 2, or 3*** Speed or **ECM** |

### Communication

| BAC | Mod | 🔲 |
|---|---|---|
| **BACnet** MS/TP | **Modbus** RTU Slave | **Room Sensor** 3 Wires (Digital) |

*Configurable

## Models

| Model | Type | Extra 3A Relay |
|---|---|---|
| EFCB10TU2 | 24Vac | 2 |
| EFCB10TU4 | | 4 |
| EFCB11TU2 | 120Vac | 2 |
| EFCB11TU4 | | 4 |
| EFCB12TU2 | 240Vac | 2 |
| EFCB12TU4 | | 4 |

## Controller (EFCB)

- Real Time Clock (RTC) with 24 hour backup
- Configurable PI (Proportional-Integral) function
- Selectable proportional control band and dead band
- Independent cool/heat setpoint for NSB/OCC mode
- Selectable internal or external temperature sensor (10KΩ)
- Change over by contact or external temperature sensor
- Freeze protection
- BACnet MS/TP or Modbus communication (selectable)
- BACnet scheduler
- Firmware upgradeable via BACnet
- 4 AI can be configured as Dry Contacts
- Digital room sensor with onboard or external $CO_2$ sensor with integrated logic
- ECM with Enable/Disable option

## Applications

- 2 or 4 pipe systems
- Fan coil unit (up to 3 speeds and/or analog 0-10Vdc)
- Cooling signal (on/off, floating or modulating 0-10Vdc)
- Heating signal (on/off, floating, pulse or modulating 0-10Vdc)
- Reheat signal (on/off, floating, pulse or modulating 0-10Vdc)

# TDF



## Fan Coil
## Digital Room Sensors

**NEW**

| ● TDF10 | ● TDF40 | ○ TDF70 | ● TDF00 | ● TDF30 | ○ TDF60 |

## Models

| Horizontal Models | Temp. | RH | CO₂ |
|---|---|---|---|
| ● TDF10-100<br>● TDF40-100<br>○ TDF70-100 | • | | |
| ● TDF10-101<br>● TDF40-101<br>○ TDF70-101 | • | • | |
| ● TDF10-102<br>● TDF40-102<br>○ TDF70-102 | • | • | • |
| ● TDF10-103<br>● TDF40-103<br>○ TDF70-103 | • | | • |

| Vertical Models | Temp. | RH | CO₂ | PIR | VOC |
|---|---|---|---|---|---|
| ● TDF00-100<br>● TDF30-100<br>○ TDF60-100 | • | | | | |
| ● TDF00-101<br>● TDF30-101<br>○ TDF60-101 | • | • | | | |
| ● TDF00-102<br>● TDF30-102<br>○ TDF60-102 | • | • | • | | |
| ● TDF00-104<br>● TDF30-104<br>○ TDF60-104 | • | | | • | |
| ● TDF00-105<br>● TDF30-105<br>○ TDF60-105 | • | • | | • | |
| ● TDF00-106<br>● TDF30-106<br>○ TDF60-106 | • | • | • | | • |
| ● TDF00-107<br>● TDF30-107<br>○ TDF60-107 | • | • | • | • | • |

## Universal Digital Room Sensor (TDF)

• Built-in temperature sensor and optional humidity, CO₂, VOC and occupancy sensors (select models)

• Elegant design

• Universal wall-mount design

• Used to configure and operate the EFCB Fan Coil controllers

• Three wire connection between digital room sensor and controller

• Selectable Fahrenheit or Celsius scale

• BACnet service port via on-board mini USB connector

• Horizontal or vertical configuration

# TSUB

**Fan Coil**
**Wall Mount Controller**

**BACnet™**

**Modbus**

## Inputs

**AI2**
**2** Analog*
(Universal)

**24**Vac

## Outputs

**BO5**
**5** Binary*

**AO2**
**2** Analog*

**1, 2, or 3*** Speed
or **ECM**

## Communication

**BAC**
**BACnet**
MS/TP

**Mod**
**Modbus**
RTU Slave

*Configurable*

## Models

| Models | Temp. | RH | PIR |
|---|---|---|---|
| ○ TSUB00-100<br>● TSUB30-100<br>○ TSUB60-100 | • | | |
| ○ TSUB00-101<br>● TSUB30-101<br>○ TSUB60-101 | • | • | |
| ○ TSUB00-104<br>● TSUB30-104<br>○ TSUB60-104 | • | | • |
| ○ TSUB00-105<br>● TSUB30-105<br>○ TSUB60-105 | • | • | • |

## Main Features

- Optional internal/external humidity sensor input for simple and accurate humidity control
- Internal/external occupancy input
- Dehumidification sequence compensated by auto activation of reheat output
- Real time clock (RTC) with 24-hour backup
- Precise temperature control with configurable PI (Proportional-Integral) function
- Selectable internal or external temperature sensor
- Low limit set protection (10°C/50°F)
- Occupancy and night set back (NSB) mode
- Selectable direction on outputs
- Option of pulse/floating/on-off output on binary outputs
- Compressor anti-cycling delay (configurable)
- ΔT control (on request)
- Selectable BACnet MS/TP or Modbus communication
- Selectable Fahrenheit or Celsius scale
- Multi level lockable access menu and setpoint

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# TSU

**NEW**



## Fan Coil
### Standalone Wall Mount Controller

### Inputs

| AI2 | ⏻ |
|-----|-----|
| **2** Analog* (Universal) | **24**Vac |

### Outputs

| BO5 | AO2 | 🌀 |
|-----|-----|-----|
| **5** Binary* | **2** Analog* | **1, 2, or 3*** Speed or **ECM** |

*Configurable

## Main Features

- Optional internal/external humidity sensor input for simple and accurate humidity control
- Internal/external occupancy input
- Dehumidification sequence compensated by auto activation of reheat output
- Precise temperature control with configurable PI (Proportional-Integral) function
- Selectable internal or external temperature sensor
- Real time clock (RTC) with 24-hour backup
- 7-day programmable schedule

## Models

| Models | Temp. | RH | PIR |
|--------|:-----:|:--:|:---:|
| ● TSU00-110 | • | | |
| ● TSU00-111 | • | • | |
| ● TSU00-114 | • | | • |
| ● TSU00-115 | • | • | • |

# CCC



## Fan Coil
### Relay Interface Board

## Main Features

- 240/120 Vac
- 3, 4 or 5 contacts
- Metal box with secure 4-point mounting
  (models without enclosure also available)
- Equipped with built-in transformer (12VA max)

## Applications

- Ideal for fan coil applications where 240/120 Vac equipment must be controlled by a 24Vac digital room sensor
- Designed to operate with TFC, TUCB, TSU, TSUB and TUUB controllers

## Models

| Model | Voltage | Contact Ratings | | Number of Outputs |
|-------|---------|:---------------:|:-----:|:-----:|
| | | **Resistive** | **Motor** | |
| CCC713-07 | | | | 3 |
| CCC714-07 | 120 Vac | | | 4 |
| CCC715-07 | | 7 A | 1/4 HP | 5 |
| CCC723-07 | | | | 3 |
| CCC724-07 | 240 Vac | | | 4 |
| CCC725-07 | | | | 5 |

CE    ETL Intertek LISTED c us

# EVCB



## VAV
## Unit Controller



VAV unit controller (EVCB) with Digital Room Sensor (TDU)

### Inputs

| DI2 | AI2 | ≈ | ⏻ |
|---|---|---|---|
| **2** Digital* | **2** Analog* | **Pressure Sensor** (select models) | **24**Vac |

### Outputs

| BO4 | AO2 |
|---|---|
| Up to **4** TRIACs | **2** Analog* |

### Communication

| BAC | Mod | |
|---|---|---|
| **BACnet** MS/TP *Configurable* | **Modbus** RTU Slave | **Room Sensor** 3 Wires (Digital) |

## Models

| Model | TRIACS | Pressure Type | Feedback | Fan Powered Box |
|---|---|---|---|---|
| EVCB14NIT0S | 0 | Indep. | | |
| EVCB14NIT2S | 2 | Indep. | | |
| EVCB14NIT4S | 4 | Indep. | | • |
| EVCB14NDT4S | 4 | Dep. | | • |
| EVCB14NIT0SF | 0 | Indep. | • | |
| EVCB14NIT4SF | 4 | Indep. | • | • |

## External Motor

| Model | TRIACS | Pressure Type | Motor |
|---|---|---|---|
| EVCB14NIT4X | 4 | Indep. | External |
| EVCB14NDT4X | 4 | Dep. | External |

## Dual Duct

| Model | TRIACS | Pressure Type | Type |
|---|---|---|---|
| EVCBM14NIT2S | 2 | Indep. | Master Controller |
| EVCS14N | - | - | Slave Controller |

## Controller (EVCB)

- Built-in actuator, 70 in.lb. (8Nm) (select models)
- On board differential pressure sensor (select models)
- Simple air balancing and commissioning via digital room sensor
- Automatically sets operation mode to pressure dependent or independent based on the presence of air flow
- Configurable PI (Proportional-Integral) function
- Independent, configurable proportional control band and dead band per ramp
- Selectable internal or external temperature sensor (10KΩ)
- Digital room sensor with on-board or external $CO_2$ sensor with integrated logic
- Changeover by contact or external temperature sensor
- Real time clock (RTC) with 24-hour backup
- BACnet MS/TP or Modbus communication (selectable)
- BACnet scheduling

## Applications

- Single duct, cooling only and/or heating
- Up to 4 stage reheat and/or cool
- Up to 4 On/Off heat and/or cool
- Up to 4 time proportioned (TPM) heat or reheat
- Up to 2 analog (0-10Vdc) reheat and/or cool
- Up to 2 floating heat and/or cool
- Pressure dependent or pressure independent
- With or without auto changeover
- Supply/exhaust (requires an additional EVC)

# TDU
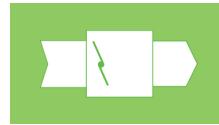
## VAV
## Digital Room Sensors

**NEW**

● TDU10    ● TDU40    ○ TDU70    ● TDU00    ● TDU30    ○ TDU60

## Models

| Horizontal Models | Temp. | RH | CO₂ |
|---|---|---|---|
| ● TDU10-100<br>● TDU40-100<br>○ TDU70-100 | • | | |
| ● TDU10-101<br>● TDU40-101<br>○ TDU70-101 | • | • | |
| ● TDU10-102<br>● TDU40-102<br>○ TDU70-102 | • | • | • |
| ● TDU10-103<br>● TDU40-103<br>○ TDU70-103 | • | | • |

| Vertical Models | Temp. | RH | CO₂ | PIR | VOC |
|---|---|---|---|---|---|
| ● TDU00-100<br>● TDU30-100<br>○ TDU60-100 | • | | | | |
| ● TDU00-101<br>● TDU30-101<br>○ TDU60-101 | • | • | | | |
| ● TDU00-102<br>● TDU30-102<br>○ TDU60-102 | • | • | • | | |
| ● TDU00-104<br>● TDU30-104<br>○ TDU60-104 | • | | | • | |
| ● TDU00-105<br>● TDU30-105<br>○ TDU60-105 | • | • | | • | |
| ● TDU00-106<br>● TDU30-106<br>○ TDU60-106 | • | • | • | | • |
| ● TDU00-107<br>● TDU30-107<br>○ TDU60-107 | • | • | • | • | • |

## Universal Digital Room Sensor (TDU)

- Built-in temperature sensor and optional humidity, CO₂, VOC and occupancy sensors (select models)
- Elegant design
- Universal wall-mount design
- Used to configure and operate the EVCB VAV controllers
- Three wire connection between digital room sensor and controller
- Selectable Fahrenheit or Celsius scale
- BACnet service port via on-board mini USB connector
- Horizontal or vertical configuration

# TRO24/TRO54
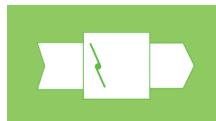
## VAV
### Wall Mount Controller



## TRO24

Combination VAV controller and room thermostat.
*Run control wires directly to TRO unit.*

### BACnet Model

| Model | Options |
|---|---|
| TROB24T4XYZ1 | BACnet |

### Stand-Alone Models

| Model | Options |
|---|---|
| TRO24T4XYZ1 | |
| TRO24T4XYZ3 | Scheduler |
| TRO24-EXT1 | Extended setpoint range |

### Applications

Ideal for existing installations and retrofits that already have an actuator mounted on the VAV box.

### TRO54 Stand-Alone Models

| Model | Analog outputs | TPM/Digital outputs | Sensor inputs |
|---|---|---|---|
| TRO5404 | 4 | 1 TPM | 2 |
| TRO54P3X1 | 2 | 3 Digital | 2 |

## Inputs

**AI3**
**3** Analog*

(power) **24Vac**

## Outputs

**BO4**
**4** TRIACs*

**AO2**
**2** Analog*

## Communication

**BAC**
**BACnet**
MS/TP
*Configurable*

## Main Features

- Programmable PI function
- Selectable proportional control band and dead band
- Pressure sensor input with air flow program
- Selectable internal or external temperature sensor
- Changeover by contact or external temperature sensor
- Freeze protection
- Backlit LCD with simple icon and text driven menus
- Selectable Fahrenheit or Celsius scale
- Manual Night set back override
- Multi level lockable access menu and setpoint

## Main Features

- 24Vac operation
- Backlit LCD with simple icon and text driven menus
- Selectable Fahrenheit or Celsius scale
- "Night Set Back" mode with manual override
- Multi level lockable access menu and setpoint
- Selectable internal or external temperature sensor
- Selectable proportional control band

# TUUB

## Universal
### Wall Mount Controller

**BACnet** (ASHRAE) · **Modbus**

Packaged AC Rooftop Units · Heat Pumps · Fan Coils

## Inputs

| **AI4** | **⏻** |
|---|---|
| 4 Analog* (Universal) | 24Vac |

## Outputs

| **BO6** | **AO4** | 🌀 |
|---|---|---|
| 6 Binary* | 4 Analog* | 1, 2, or 3* Speed or ECM |

## Communication

| **BAC** | **Mod** |
|---|---|
| BACnet MS/TP | Modbus RTU Slave |

*Configurable

## Models

| Models | Temp. | RH | CO₂ | PIR | VOC |
|---|:---:|:---:|:---:|:---:|:---:|
| ● TUUB00-100<br>● TUUB30-100<br>○ TUUB60-100 | • | | | | |
| ● TUUB00-101<br>● TUUB30-101<br>○ TUUB60-101 | • | • | | | |
| ● TUUB00-102<br>● TUUB30-102<br>○ TUUB60-102 | • | • | • | | |
| ● TUUB00-104<br>● TUUB30-104<br>○ TUUB60-104 | • | | | • | |
| ● TUUB00-105<br>● TUUB30-105<br>○ TUUB60-105 | • | • | | • | |
| ● TUUB00-106<br>● TUUB30-106<br>○ TUUB60-106 | • | • | • | | • |
| ● TUUB00-107<br>● TUUB30-107<br>○ TUUB60-107 | • | • | • | • | • |

## Main Features

- Optional internal/external humidity sensor input for simple and accurate humidity control
- Internal/external occupancy input
- Optional built-in CO₂ and VOC sensors
- Output selector jumper to switch between BO7 and AO1
- Dehumidification sequence compensated by auto activation of reheat output
- Real time clock (RTC) with 24-hour backup
- Precise temperature control with configurable PI (Proportional-Integral) function
- Selectable internal or external temperature sensor
- Low limit set protection (10°C/50°F)
- Occupancy and night set back (NSB) mode
- Selectable direction on outputs
- Option of pulse/floating/on-off output on binary outputs
- Internal/external occupancy input
- Compressor anti-cycling delay (configurable)
- ΔT control (on request)
- BACnet MS/TP or Modbus communication (selectable)

## Universal Applications

- Fan coil units (2 or 4 pipes)
- Rooftop units
- Heat pumps
- Humidity control
- Packaged or split unitary systems
- Other heating/cooling equipment

# ARO/AROB

## IAQ
## Wall Mount Controller



BACnet™ Modbus

### Stand-Alone Models

| Model | Temp. | RH | CO₂ | VOC |
|---|---|---|---|---|
| ARO24T | • | | | |
| ARO24TH | • | • | | |
| ARO24TGH | • | • | • | |
| ARO24TGVH | • | • | • | • |

### Networkable Models

| Model | Temp. | RH | CO₂ | VOC |
|---|---|---|---|---|
| AROB24T | • | | | |
| AROB24TH | • | • | | |
| AROB24TGH | • | • | • | |
| AROB24TGVH | • | • | • | • |

### Inputs

| BI1 | AI1 |
|---|---|
| **1** Binary* | **1** Analog |

### Outputs

| BO2 | AO2 | ECM |
|---|---|---|
| **2** Binary* | **2** Analog* | |

### Communication

| BAC | Mod |
|---|---|
| **BACnet** MS/TP | **Modbus** RTU Slave |

*Configurable*

### Main Features

- Built-in application profiles to automatically configure the controller for the selected application.
- Up to 4 simultaneous control loops
- Integrated ECM fan control mode
- Displays temperature, %RH, CO₂, VOC, and setpoints
- Display or hide all the required access for user interaction
- Precise temperature control with programmable PI function
- Independent cool and heat setpoint for No Occupancy

# HROB20

## Humidity Control
## Wall Mount Controller



BACnet™

### Applications

- Neptronic SKR, SKE4, SKS4, and SKG4 humidifiers
- Other humidification and dehumidification applications

### Main Features

- BACnet MS/TP (stand-alone model HRO20 also available)
- 4 analog outputs and 2 dry contact outputs
- 2 configurable analog inputs
- Window or external temperature sensor input
- Alarm status and low signal selector input
- Independently configure PID on humidify & dehumidify ramps
- Adjustable setpoint with auto reset from external sensor
- Multi level lockable access menu, setpoint and control mode

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# CMMB100

**I/O**

## Dual Mini Input Module
### Expansion Controller

**NEW**

BACnet
ASHRAE

Modbus

📊 Input expansion board (CMMB)

### Inputs

| **AI8** | ⏻ |
|---------|---|
| **8 Analog***(Universal) | **24**Vac/**24**Vdc |

### Communication

| **BAC** | **Mod** |
|---------|---------|
| **BACnet** MS/TP | **Modbus** RTU Slave |

*Configurable

### Main Features

- BACnet MS/TP or Modbus communication (selectable)
- LED status indication of each input
- DIN rail mounting
- Removable see-through panel for easy access to DIP switches
- Optional plug-in connectors allowing for expansion

## Models

| Model | Inputs | Expansion Plug-in Connectors |
|-------|--------|------------------------------|
| CMMB100 | 8 | |
| CMMB100E | 8 | • |

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# CMMB102

**I/O**

## Dual Mini I/O Module
### Expansion Controller

**NEW**

BACnet
ASHRAE

Modbus

📊 Input and output expansion board (CMMB)

### Inputs

| **AI4** | ⏻ |
|---------|---|
| **4 Analog***(Universal) | **24**Vac/**24**Vdc |

### Outputs

| **BO2** | **AO2** | **SW** |
|---------|---------|--------|
| **2 Binary*** | **2 Analog***(Universal) | **4 Override Switches** |

### Communication

| **BAC** | **Mod** |
|---------|---------|
| **BACnet** MS/TP | **Modbus** RTU Slave |

*Configurable

## Models

| Model | Inputs | Outputs | Expansion Plug-in Connectors |
|-------|--------|---------|------------------------------|
| CMMB102 | 4 | 4 | |
| CMMB102E | 4 | 4 | • |

### Main Features

- BACnet MS/TP or Modbus communication (selectable)
- 4 override switches to manually control each output
- LED status indication of each input and output
- DIN rail mounting
- Removable see-through panel for easy access to DIP switches
- Optional plug-in connectors allowing for expansion

# CMMB106

## I/O
## Dual Pro I/O Module
## Expansion Controller



**BACnet** ASHRAE

**Modbus**

CE  BTL

*Input and output expansion board (CMMB)*

### Models

| Type | Model | Buttons | Inputs | Outputs |
|------|-------|---------|--------|---------|
| Exp. Board | CMMB106 | | 10 | 10 |
| Thermostat | STLD24A | Fan & heat-cool | 1 | |
| Thermostat | STLD24B | Fan & ˚F/˚C | 1 | |

### Expansion Board (CMMB)

- BACnet MS/TP or Modbus communication (selectable)
- 10 inputs and 10 supervised outputs
- 10 override switches to manually control each output
- LED status indication of each input and output
- DIN rail mounting

### Inputs

| DI2 | AI8 | ⏻ |
|-----|-----|---|
| **2** Digital* | **8** Analog* (Universal) | **24**Vac/ **30**Vdc |

### Outputs

| DO6 | AO4 | SW |
|-----|-----|-----|
| **6** Digital* | **4** Analog* | **10** Override Switches |

### Communication

| BAC | Mod |
|-----|-----|
| **BACnet** MS/TP | **Modbus** RTU Slave |
| *Configurable* | |

### Room Thermostat (STLD)

- User Interface fully customizable via Modbus RTU
- Backlit LCD with simple icon and text driven menus
- Built-in temperature sensor
- External temperature sensor input (10 KΩ)
- Selectable Fahrenheit or Celsius scale
- Set Modbus RTU baud rate via thermostat menu (9600, 19200, 38400 or 57600 bps)
- Set Modbus RTU address via thermostat menu or via DIPswitch

# CMMB-IP

## IP I/O Module
### Expansion Controller

ASHRAE **BACnet**™

**Modbus**

## Inputs

| BI2 | AI8 | ⏻ |
|-----|-----|---|
| **2** Binary* | **8** Analog* (Universal) | **24**Vac/ **24**Vdc |

## Outputs

| BO6 | AO4 | SW |
|-----|-----|-----|
| **6** Binary* | **4** Analog* | **10** Override Switches |

## Communication

| BAC | Mod | IP |
|-----|-----|-----|
| **BACnet** MS/TP, IP *Configurable* | **Modbus** RTU Slave, TCP/IP | **IP** Network & Web Services |

## Models

| Model | Router | Display | Communication Ports | |
|-------|--------|---------|-------------|-------------|
| | | | BACnet Ports | Modbus Ports |
| CMMB-IP | | | 1 | 1 |
| CMMB-IP-L | | • | 1 | 1 |
| CMMB-IP-R1B | • | | 1 | |
| CMMB-IP-R2B | • | | 2 | |
| CMMB-IP-RL1B | • | • | 1 | |
| CMMB-IP-RL2B | • | • | 2 | |

## Network Communication

### BACnet MS/TP
- MS/TP @ 9600, 19200, 38400 or 76800 bps
- Automatic baud rate detection
- Automatic device instance configuration

### BACnet IP/Ethernet
- All IP/Ethernet configuration via on board WEB page
- Display device status including each available data point, in addition to the BACnet object interface
- Supports DHCP or fixed/static addressing

### Modbus RTU
- Modbus @ 9600, 19200, 38400 or 57600 bps
- RTU Slave, 8 bits (configurable parity and stop bits)
- Connects to any Modbus master

### Modbus TCP/IP
- Connects to any Modbus TCP/IP master controller

## Features

### Power & Communication
- 24Vac or 24Vdc supply
- Up to 2 RS-485 communication ports for BACnet MS/TP or Modbus RTU
- BACnet IP/Ethernet or Modbus TCP/IP
- Set network settings via embedded WEB server
- Provision for I/O expansion modules
- Router functionality (optional)

### 10 Inputs
- 2 binary inputs
- 8 universal inputs

### 10 Outputs
- 6 binary outputs
- 4 analog outputs
- Supervised manual override of outputs via local web page or local dip switches

### Other
- SD card slot for updates
- USB port for 5 Vdc power supply
- RJ45 Ethernet connection for IP and WEB services
- Optional LCD display

# CMMB1322

**I/O**

# Mini I/O Module
## Expansion Controller



**BACnet™**

*Input and output expansion board (CMMB)*

## Models

| Type | Network | Inputs | Outputs |
|------|---------|--------|---------|
| CMMB1322 | BACnet MS/TP | 2 | 2 |

## Main Features

- BACnet MS/TP
- 2 inputs and 2 supervised outputs
- 2 override switches to manually control each output
- 120Vac or 240 Vac selectable power input
- 2 auxiliary outputs (24Vdc / 24Vac)

### Inputs

**AI2**

**2** Analog*
(Universal)

**120** or **240**Vac
(selectable)

### Outputs

**BO2**

**2** Binary*

**SW**

**2** Override
Switches

**24**Vdc and **24**Vac
(aux. output)

### Communication

**BAC**

**BACnet**
MS/TP

*Configurable*

---

# RPB

**NEW**

**BACnet™**

# BACnet Router

## Models

| Model | Description | Devices |
|-------|-------------|---------|
| RPB11 | 1-Port BACnet | Up to 32 |
| RPB12 | 2-Port BACnet | Up to 64 |

## Main Features

- One page, set-and-forget configuration and unique network discovery capabilities minimize installation time
- Up to 32 or 64 BACnet devices without the use of additional line drivers
- Simple web based configuration for BACnet IP and MS/TP communication
- Lowest cost per connected MS/TP device

### Inputs

**24**Vac

### Communication

**BAC**

**BACnet**
MS/TP, IP

- Lowest response time per connected MS/TP device
- Built-in network diagnostics
- Connect using Expansion slot to convert CMMB100E and CMMB102E as IP I/O cards
- Support up to 3 mini I/O cards in any combination and make them IP ready while maintaining the 2 MS/TP ports for BACnet routing

# Typical System Architecture

**BMS Server**

BACnet/IP

3<sup>rd</sup> Party Integration Protocol

BACnet/IP

**BACnet Router**

**3<sup>rd</sup> Party Integrator**

**CMMB-IP**

**BACnet MS/TP / Modbus RTU**

**BACnet MS/TP**

EVCB

EFCB

EVCB

EVCB

EVCB

TUUB

EFCB

EFCB

EVCB

CMMB106

TSUB

TSUB
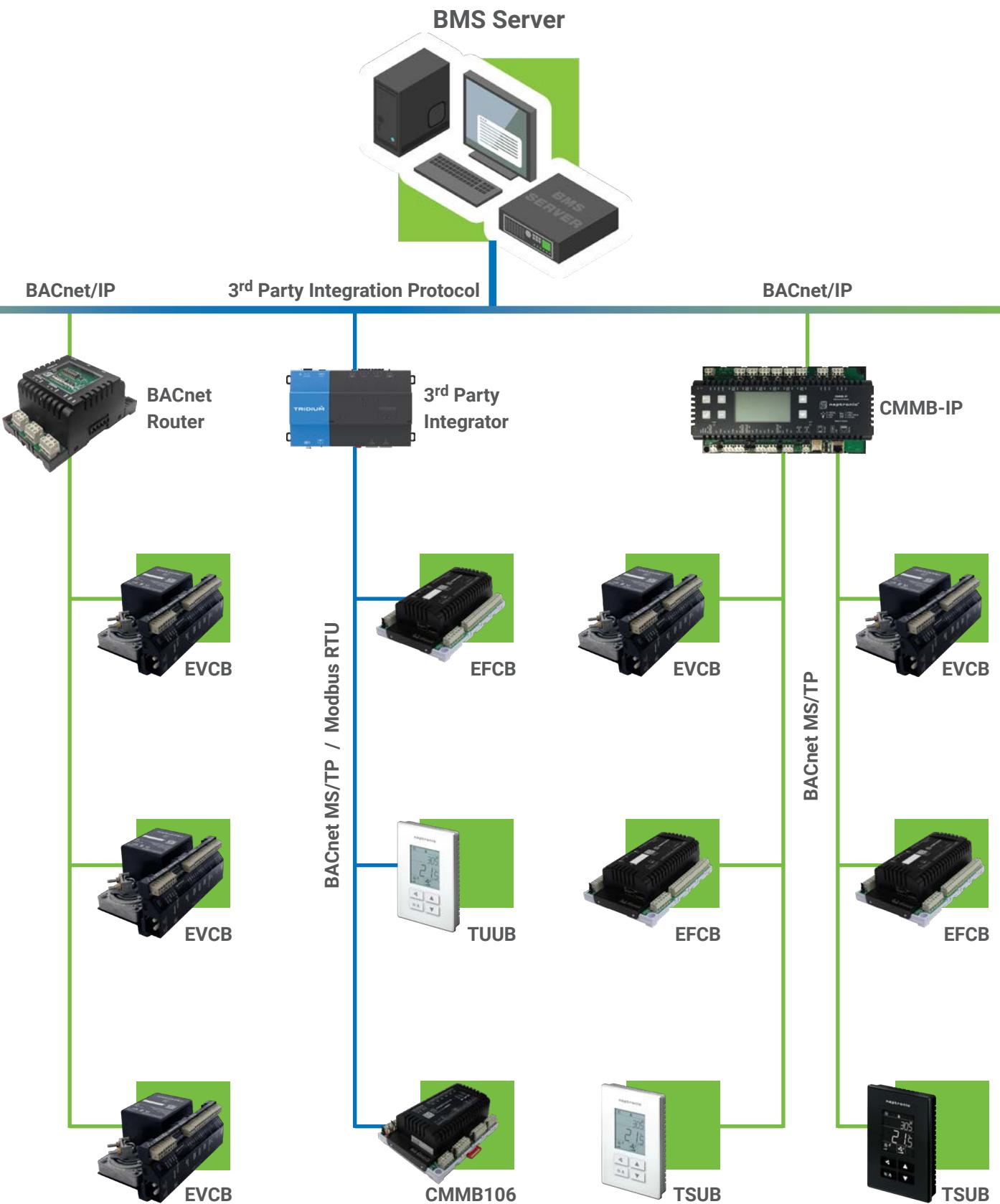
# SARB

**BACnet™**  **Modbus**

## Models

| Model | Temp. | RH | CO₂ | VOC |
|---|:---:|:---:|:---:|:---:|
| SARB24T | • | | | |
| SARB24TH | • | • | | |
| SARB24TG | • | | • | |
| SARB24TV | • | | | • |
| SARB24TGH | • | • | • | |
| SARB24TGVH | • | • | • | • |

## Inputs

| BI1 | AI1 | ⏻ |
|:---:|:---:|:---:|
| **1** Binary | **1** Analog | **24**Vdc/ **24**Vac |

## Outputs

| BO2 | AO2 |
|:---:|:---:|
| **2** Binary* | **2** Analog* |

## Communication

| BAC | Mod |
|:---:|:---:|
| **BACnet** MS/TP | **Modbus** RTU Slave |

*Outputs commandable via network*

## Main Features

- 2 inputs and 4 outputs commandable via network
- Enthalpy and dew point calculations (available via network)
- Display or hide all the required access for user interaction
- Backlit LCD with simple icon and text-driven menus
- Selectable Fahrenheit or Celsius scale

- BACnet® MS/TP or Modbus (selectable via menu)
- Select MAC address via menu or via network
- Automatic baud rate detection
- Network service port via on-board mini USB connector

# SAR

## Models

| Model | Temp. | RH | CO₂ | VOC |
|---|:---:|:---:|:---:|:---:|
| SAR24GH | | • | • | |
| SAR24GV | | | • | • |

## Main Features

- CO₂ sensor feedback output (AO1)
- CO₂ warning and alarm level outputs (BO1 and BO2)
- Humidity or VOC sensor feedback output (AO2)
- Input voltage 24Vac or 24Vdc

# Sensors

# Humidity

### SHC80: Duct Mount Humidity Sensor

- Duct mounted humidity sensor
- Built-in temperature sensor
- 2 analog outputs (0 - 10 Vdc)
- Status LED

### SHR10: Wall Mount Humidity Sensor

- Wall mounted humidity sensor
- Built-in temperature sensor
- Plastic cover for wall mount installation
- 2 analog outputs (0 - 10 Vdc)
- High accuracy and stability

### SHS80: Duct Mount, High Limit Humidistat

- Built-in temperature and humidity sensor
- On/Off high limit humidistat with on-board setpoint adjustment
- 2 analog outputs (0-10 Vdc)
- Status and high limit LEDs
- 1 dry contact output

### HRL24: Room Humidistat

- Used to program the SK4 series humidifiers
- Icon-driven information and 1 line of text information
- 4 wires between humidistat and SK4
- Programmable PID on humidity

### SHS20: Room High Limit Humidistat

- High-limit setpoint dial (20 - 90% RH)
- Built-in humidity sensor
- 24Vac or 24Vdc
- 1 dry contact output

### HRC20: Room Humidistat

- Humidity setpoint dial (10-60 %RH)
- Built-in humidity sensor
- 24Vac or 24Vdc
- 1 dry contact output

# Sensors

# Pressure

| Model | Pressure Range |
|---|---|
| SPC 0.1 | 0 to 0.1" w.c.[25 Pa] |
| SPC 1.0 | 0 to 1.0" w.c.[250 Pa] |
| SPC 2.0 | 0 to 2.0" w.c.[500 Pa] |
| SPC 5.0 | 0 to 5.0" w.c.[1245 Pa] |

#### SPC: Static Pressure Controller

- Simple installation and configuration
- Displays actual pressure reading
- Adjustable setpoint, dead band and response speed
- Selectable output signal
- Direct or reverse action outputs
- Fully calibrated
- Real-time pressure output for remote monitoring

| Model | Pressure Range | Enclosure |
|---|---|---|
| SPD00-010 | 0-1" w.c.[250 Pa] | PCB only |
| SPD70-010 | 0-1" w.c.[250 Pa] | Metal enclosure |
| SPD00-020 | 0-2" w.c.[500 Pa] | PCB only |
| SPD70-020 | 0-2" w.c.[500 Pa] | Metal enclosure |
| SPD00-050 | 0-5" w.c.[1245 Pa] | PCB only |
| SPD70-050 | 0-5" w.c.[1245 Pa] | Metal enclosure |

#### SPD: Static Pressure Differential Transducer

- Small footprint
- Simple and easy to install
- Selectable output signal (0-10 or 2-10 Vdc & 4-20 or 0-20mA)
- High flow impedance in the range of tens to hundreds of kPa

# Sensors

# Temperature

### STC8: Duct Mount Temperature Sensor

- High accuracy and stability
- Fast thermal response
- Epoxy encapsulated sensor
- Extended durability
- Resistor/Temperature Curve
  - "G" matched (STC8-11, 10KΩ)
  - "A" matched (STC8-13, 3.3 KΩ)
- Compatible with Neptronic controllers

| STC8-11 | 10KΩ |
|---------|--------|
| STC8-13 | 3.3KΩ |
| STC80X | Analog |
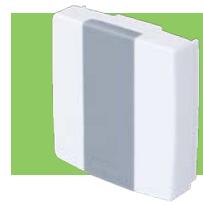
### STR1: Wall Mount Temperature Sensor

- Available with 10KΩ or 3.3KΩ thermistor
- High accuracy and stability
- Negative Temperature Coefficient (NTC)
- Compatible with Neptronic products

| STR1-11 | 10KΩ |
|---------|--------|
| STR1-13 | 3.3KΩ |

### STP: Strap-On Water Temperature Sensor

- High accuracy and stability
- 10KΩ Type III Thermistor
- Designed for fan coil 2 pipe changeover applications
- Sensitive to non-polarity
- Temperature range: -40°C to 150°C (-40°F to 302°F)

| STP7-11 | Metal |
|---------|---------|
| STP1-11 | Plastic |

### STI1-11: Immersion Water Temperature Sensor

- 10KΩ Type III Thermistor
- Immersion type temperature sensor
- Double encapsulation sensor eliminates moisture infiltration
- Machined 5 Brass thermowell
  - ABS plastic enclosure
  - Quick snap latch
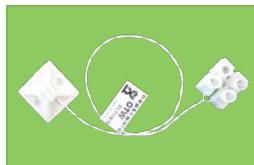
### OTW/SHW: Window Temperature Sensor

- 10KΩ (SHW0-11) or 3.3KΩ (OTW) temperature sensor
- Self adhesive: sticks directly on window

# Accessories

### CVC

- 24Vac or 24 Vdc supply
- 2 or 4 SPDT relays (staged or sequenced operation)
- Voltage or current input
- Adjustable relay setpoint, hysteresis and activation delay
- Input signal management (loss of signal)
- Displays input voltage or current
- LED status indication of each relay
- Snap Track mounting
- Non-strip, raising clam terminals

| Model | Relays |
|--------|--------|
| CVC002 | 2 |
| CVC004 | 4 |

### SCC80: Changeover Control Sensor

- 24Vac or 24 Vdc supply
- Sensor operation temperature up to 80°C [176°F]
- Fast response, excellent accuracy
- SPDT output relay
- No adjustments required (pre-calibrated)
- Built-in mounting tabs and mounting screws supplied for easy installation
- Status LED
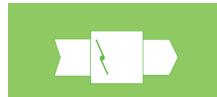
Comes with male/female collar

Total connector pressure output is routed behind probe to minimize pressure loss and noise

Bullet shaped averaging chamber for low pressure loss and noise

3/16" Static pressure signal amplification ring

Equal area total pressure port

Static pressure connector output routed behind probe to minimize loss and noise
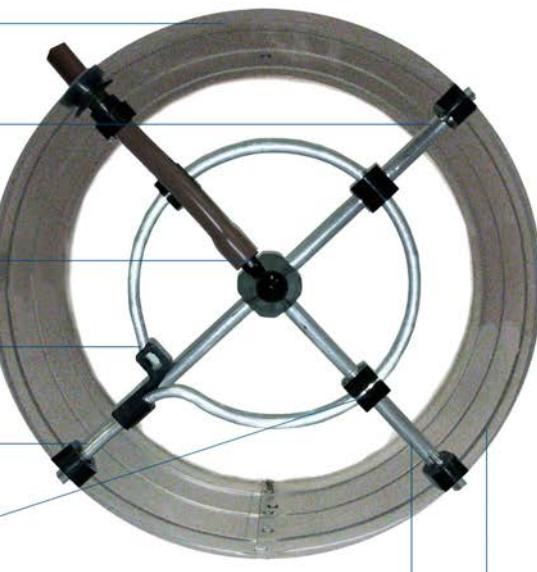
1/4" Total pressure averaging probes

22 gauge galvanized steel

## Air Flow Stations

*Mechanically amplifies the differential pressure signal making air velocity measurement in VAV boxes possible.*

## Main Features

- Mechanical amplification of differential pressure signal
- 2 outputs (total pressure and static pressure)
- Advanced design minimizes pressure loss and white noise

## Models

| Description | CF-06 | CF-08 | CF-10 | CF-12 | CF-14 | CF-16 |
|---|---|---|---|---|---|---|
| Inlet Diameter | 6" (15.25 cm) | 8" (20.30 cm) | 10" (25.40 cm) | 12" (30.50 cm) | 14" (35.56 cm) | 16" (40.64 cm) |
| Area | 0.196 ft² (0.018 m²) | 0.349 ft² (0.032 m²) | 0.545 ft² (0.050 m²) | 0.785 ft² (0.073 m²) | 1.069 ft² (0.099 m²) | 1.396 ft² (0.130 m²) |
| Velocity Constant | 2812 FPM (14.3 m/s) | 2740 FPM (13.9 m/s) | 2841 FPM (14.4 m/s) | 2822 FPM (14.3 m/s) | 2666 FPM (13.5 m/s) | 2837 FPM (14.4 m/s) |
| Velocity Pressure Constant | 0.49 | 0.47 | 0.50 | 0.49 | 0.45 | 0.50 |
| K Factor | 552 CFM (261 l/s) | 956 CFM (451 l/s) | 1550 CFM (732 l/s) | 2216 CFM (1046 l/s) | 2850 CFM (1345 l/s) | 3961 CFM (1869 l/s) |
| Amplification Factor F | 2.60 | 2.30 | 2.30 | 2.15 | 2.15 | 2.10 |
| Total Pressure Ports (ASHRAE Standard 62) | 12 | 12 | 16 | 16 | 20 | 20 |
| Velocity Range | 300 to 3,000 FPM (1.5 to 15.2 m/s) | | | | | |
| Temperature Range | -40°C to 80°C (-40°F to 176°F) | | | | | |
| Materials | Aluminum & PC/ABS | | | | | |

# Actuators

# Actuated Valves

## ACTUATORS

### Up to 70in.lb (8Nm)
**D-B-S**
- 35in.lb (4Nm) to 70in.lb (8Nm)

### Up to 360in.lb (40Nm)
**L-T-R**
- 140in.lb (16Nm) to 360in.lb (40Nm)

### Up to 4000in.lb (450Nm)
**U & W**
- 1800in.lb (200Nm) to 4000in.lb (450Nm)

### Fast
**B-T-R**
- Running time of 1.5sec to 30sec

### Smoke Damper
**BTX-LX**
- Rated at 250°F (121°C)

### Outdoor
**IP65**
- High humidity and outdoor applications

### Linear
**A-V-X**
- Zone, globe and PIC valve applications

## ACTUATED VALVES

### Characterized Ball

### Contoured Port Ball

### Full Port Ball

### Industrial Ball

### Butterfly

### Zone

### Globe

# HECB



# Duct Heater
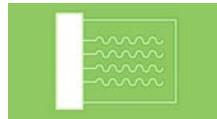
## HECB Networkable Controller
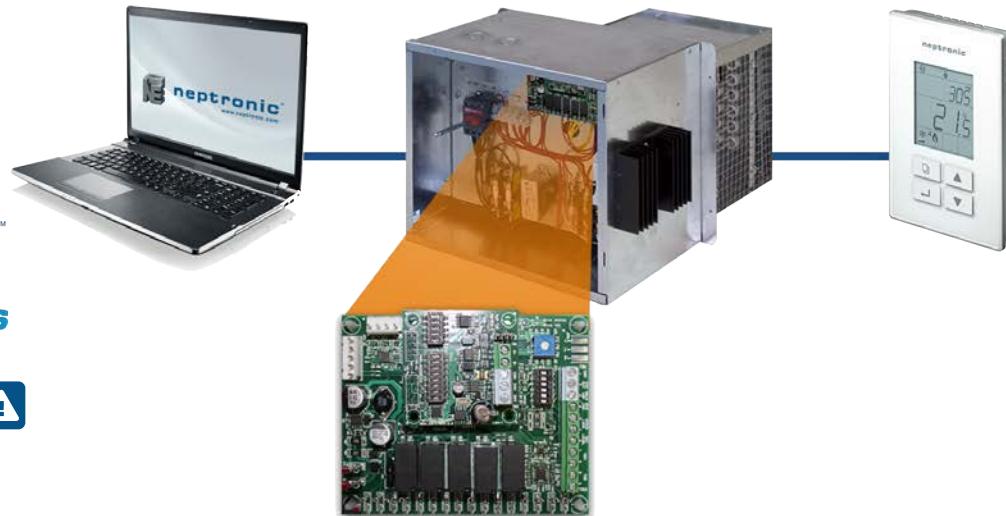


## BENEFITS

### Save Energy

- Embedded and configurable energy conservation strategies
- Automatic or dynamic load shedding
- Limit electric heater consumption based on multiple variables
- Provides real-time temperature measures and power consumption data

### Save Time

- View heater status and alarms remotely via network or thermostat
- Remote monitoring (status, alarms, diagnostics, and trending)
- Wall-mount remote user interface (view temperature, setpoint, heater status and alarms)

### Integrate

- Integrate with BMS and intelligent buildings via BACnet MS/TP or Modbus
- Multiple BACnet/Modbus points to propel you towards the Internet of Things (IoT)
- Ensure better management of energy consumption for the future

### Standard Features

- Accepts any industry standard input signal
- Quick and simple input signal selection via DIP switches
- Modulating, on/off, and/or up to 10 stages
- Real-time feedback output of heater capacity
- Automatic PID
- Remote feedback with TDU LCD thermostat (eliminates the use of expensive staged thermostats)
- Zero voltage crossing SSR
- Patented EAS Electronic Air Flow Sensors (US 7,012,223)

### Network Communication

- BACnet MS/TP or Modbus RTU (selectable via DIP switch)
- Select MAC address via DIP switch or via network

### BACnet MS/TP

- MS/TP @9600, 19200, 38400 or 76800 bps
- BACnet scheduler (up to 6 events)
- Firmware upgradeable via network
- COV (change of value)
- Copy and broadcast configuration to other HECB controllers via menu or network
- Automatic baud rate detection
- Automatic device instance configuration

### Modbus RTU

- Modbus RTU @9600, 19200, 38400 or 57600 bps
- RTU Slave, 8 bits (configurable parity and stop bits)
- Connects to any Modbus RTU master

MANUFACTURER OF ■

■ HVAC CONTROLS

■ ELECTRIC ACTUATORS

■ ACTUATED VALVES

■ HUMIDIFIERS

■ ELECTRIC HEATERS

■

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