Proven integration with

niagara framework

BACnet

Modbus

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.
Princess Nora University, Saudi Arabia

UMCP Frederick Hall, Maryland (USA)

Rashid Hospital, Dubai (UAE)

Palm Tower, Qatar

NG Teng Fong General Hospital (Singapore)

Universiy of Quebec in Montreal (Canada)

Wilson project, Sidney, OHIO (USA)

International Civil Aviation Organization (ICAO)

Motorola, Israel

Thompson Tractor Company Alabaster, Alabama (USA)

UMC Frederick Hall, Maryland (USA)

Johnson Controls

Honeywell

Schneider Electric

TREND

Delta

Trane

370 TFCB wall mount controllers

3000 EVCB controllers

240 EVCB controllers

16000 EFCB controllers

niagara
Fan coil unit controller (EFCB) with Digital Room Sensor (TDU/TFL)
Choose your Digital Room Sensor model

**Models**

<table>
<thead>
<tr>
<th>Model</th>
<th>Type</th>
<th>Extra 3A Relay</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFCB10TU2</td>
<td>24Vac</td>
<td>2</td>
</tr>
<tr>
<td>EFCB10TU4</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>EFCB11TU2</td>
<td>120Vac</td>
<td>2</td>
</tr>
<tr>
<td>EFCB11TU4</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>EFCB12TU2</td>
<td>240Vac</td>
<td>2</td>
</tr>
<tr>
<td>EFCB12TU4</td>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>

**Inputs**
- DI4: 4 Digital*
- AI6: 6 Analog*
- 24Vac 120/240Vac

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

**Communication**
- BACnet MS/TP
- Modbus RTU Slave
- Room Sensor 3 Wires (Digital)

**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

**Applications**
- Fan Coil Units
- 2 pipes or 4 pipes
**LCD Digital Room Sensors**

**TDU/TFL**

- Digital Room Sensor (TFL)
  - Backlit LCD with simple icon and text driven menus
  - Select thermostat’s default display
  - BACnet service port via on-board mini USB connector
  - Selectable Fahrenheit or Celsius scale
  - Manual night set back or no occupancy override
  - Multi level lockable access menu
  - 3-wire connection to controllers
  - Used to configure and operate EFCB Fan Coil Controllers

- Universal Digital Room Sensor (TDU)
  - Built-in temperature sensor and optional humidity and CO2 sensors (see selected models)
  - Built-in light level sensor
  - 3.5” LCD display
  - Slim design
  - Universal wall-mount design
  - Used to configure and operate the EVCB VAV controllers and EFCB Fan Coil controllers
  - Selectable internal or external temperature sensor (10 KΩ)
  - Three wire connection between thermostat and controller
  - Selectable Fahrenheit or Celsius scale
  - Network service port via on-board mini USB connector
  - Approximate size 127mm x 82mm x 15mm (5” x 3.25” x 0.6”)

**TDU/TFL Models**

<table>
<thead>
<tr>
<th>Model</th>
<th>Temperature</th>
<th>Humidity</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>TFL54</td>
<td>•</td>
<td></td>
<td>3x3</td>
</tr>
<tr>
<td>TFL24</td>
<td>•</td>
<td></td>
<td>2x4</td>
</tr>
<tr>
<td>TFLH24-INT</td>
<td>• Internal</td>
<td></td>
<td>2x4</td>
</tr>
<tr>
<td>TFLH24-EXT</td>
<td>• External</td>
<td></td>
<td>2x4</td>
</tr>
</tbody>
</table>
BACnet Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Internal Humidity Sensor</th>
<th>Ext. Humidity Sensor (SHC80 Included)</th>
<th>Scheduler</th>
</tr>
</thead>
<tbody>
<tr>
<td>TFCB24F3XYZ1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>TFHB24F3XYZ1</td>
<td>-</td>
<td>Yes</td>
<td>-</td>
</tr>
<tr>
<td>TFHB24F3XYZ2</td>
<td>Yes</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Stand-Alone Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Internal Humidity Sensor</th>
<th>Ext. Humidity Sensor (SHC80 Included)</th>
<th>Scheduler</th>
</tr>
</thead>
<tbody>
<tr>
<td>TFC24F3XYZ1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>TFC24F3XYZ3</td>
<td>-</td>
<td>-</td>
<td>Yes</td>
</tr>
<tr>
<td>TFH24F3XYZ1</td>
<td>-</td>
<td>Yes</td>
<td>-</td>
</tr>
<tr>
<td>TFH24F3XYZ2</td>
<td>Yes</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Inputs

<table>
<thead>
<tr>
<th></th>
<th>DI1</th>
<th>AI2</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital (occ sensor)</td>
<td>1 Digital (occ sensor)</td>
<td>2 Analog (sensors)</td>
<td>24 Vac</td>
</tr>
</tbody>
</table>

Outputs

<table>
<thead>
<tr>
<th></th>
<th>BO3</th>
<th>AO3</th>
<th>Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 TRIACs (2 or 4 pipe, local reheat)</td>
<td>3 TRIACs (2 or 4 pipe, local reheat)</td>
<td>1, 2 or 3* Speed or ECM</td>
<td></td>
</tr>
</tbody>
</table>

Communication

BACnet MS/TP

*Configurable

Main Features

- Applications: Fan coil units (2 or 4 pipes)
- Precise temperature control with programmable PI function
- Selectable internal or external temperature sensor
- Changeover by contact or external temperature sensor
- Freeze protection
- BACnet communication
- External humidity sensor (select models)
- Dehumidification sequence (select models)
- Backlit LCD with simple icon and text driven menus
- Selectable Fahrenheit or Celsius scale
- Manual no occupancy override
- Multi level lockable access menu

Combination fan coil controller and room thermostat. Run control wires directly to TFC unit.

neptronic.com
TFC54 & CCC

Fan Coil Wall Mount Controller

Stand-Alone Models (TFC54)

<table>
<thead>
<tr>
<th>Model</th>
<th>On-off (TRIAC)</th>
<th>Analog (0-10Vdc)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TFC54F3Y1</td>
<td>Yes</td>
<td>-</td>
</tr>
<tr>
<td>TFC54F3X1</td>
<td>-</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Main Features

- Configurable inputs and outputs:
  - 2 TRIAC outputs or 2 analog outputs (depends on model)
  - 3 fan speed digital outputs (dry contacts)
  - 2 inputs
- Selectable internal or external temperature sensor
- Changeover by contact or external temperature sensor
- Selectable proportional control band and dead band
- 24Vac operation
- Selectable Fahrenheit or Celsius scale
- Manual night set back override
- Multi level lockable access menu

Inputs

<table>
<thead>
<tr>
<th>DI2</th>
<th>2 Digital (occ sensor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AO2</td>
<td>24 Vac</td>
</tr>
</tbody>
</table>

Outputs

<table>
<thead>
<tr>
<th>BO2</th>
<th>2 TRIACs (TFC54F3Y1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AO2</td>
<td>2 Analog (TFC54F3X1)</td>
</tr>
</tbody>
</table>

*Configurable

Applications

- 2 pipe systems
- 4 pipe systems

Relay Interface Board (CCC)

- 240/120 Vac
- 3, 4 or 5 contacts, 7A
- Also available in a metal box with secure 4-point mounting
- LED indication of relay status
- Fused 240/120 Vac & 24 Vac circuits

Applications

- Ideal for fan coil applications where 240/120 Vac equipment must be controlled by a 24Vac thermostat controller
- Designed to operate with TFC series thermostat

neptronic.com
**VAV Unit Controller**

**EVCB**

**VAV Unit Controller**

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

*Choose your own Digital Room Sensor model*

**VAV Unit Controllers**

<table>
<thead>
<tr>
<th>Model</th>
<th>TRIACs</th>
<th>Pressure Type</th>
<th>Feedback</th>
<th>Fan Powered Box</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVCB14NI10S</td>
<td>0</td>
<td>Indep.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>EVCB14NI12S</td>
<td>2</td>
<td>Indep.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>EVCB14NI14S</td>
<td>4</td>
<td>Indep.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>EVCB14NID14S</td>
<td>4</td>
<td>Indep.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>EVCB14NI10S</td>
<td>0</td>
<td>Indep.</td>
<td>Yes</td>
<td>-</td>
</tr>
<tr>
<td>EVCB14NI14S</td>
<td>4</td>
<td>Indep.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Without Motor**

<table>
<thead>
<tr>
<th>Model</th>
<th>TRIACs</th>
<th>Pressure Type</th>
<th>Feedback</th>
<th>Motor</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVCB14NI14X</td>
<td>4</td>
<td>Indep.</td>
<td>-</td>
<td>External</td>
</tr>
</tbody>
</table>

**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)

**Input**

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

**Outputs**

- BO4 Up to 4 TRIACs
- AO2 2 Analog*

**Communication**

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

---

**Controller (EVCB)**

- Built-in actuator, 70 in.lb. (8Nm) (select models)
- On board differential pressure sensor (select models)
- Simple air balancing and commissioning via thermostat
- 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)
- Thermostat with on-board CO₂ sensor or external CO₂ sensor with integrated logic
- Changeover by contact or external temperature sensor
- Potentiometer feedback for increased precision of actuator position (select models)
- Real time clock (RTC) with 24-hour backup
- BACnet MS/TP or Modbus communication (selectable)
Digital Room Sensors

**Universal Digital Room Sensor (TDU)**
- Built-in temperature sensor and optional humidity and CO2 sensors (see selected models)
- Built-in light level sensor
- 3.5” LCD display
- Slim design
- Universal wall-mount design
- Used to configure and operate the EVCB VAV controllers and EFCB Fan Coil controllers
- Selectable internal or external temperature sensor (10 KΩ)
- Three wire connection between thermostat and controller
- Selectable Fahrenheit or Celsius scale
- Network service port via on-board mini USB connector
- Approximate size 127mm x 82mm x 15mm (5” x 3.25” x 0.6”)

**Digital Room Sensor (TRL)**
- Backlit LCD with simple icon and text driven menus
- Built-in, self-calibrating, non-dispersive infrared (NDIR) CO2 sensor (select models)
- Select thermostat’s default display
- BACnet service port via on-board mini USB connector
- Selectable Fahrenheit or Celsius scale
- Manual night set back or no occupancy override
- Multi level lockable access menu
- 3-wire connection to controllers
- Used to configure and operate EVCB VAV Controllers

---

<table>
<thead>
<tr>
<th>Model</th>
<th>Temperature</th>
<th>RH</th>
<th>CO2</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRL54</td>
<td>★</td>
<td></td>
<td></td>
<td>3x3</td>
</tr>
<tr>
<td>TRL24</td>
<td>★</td>
<td></td>
<td></td>
<td>2x4</td>
</tr>
<tr>
<td>TRLG24</td>
<td>★</td>
<td>★</td>
<td></td>
<td>2x4</td>
</tr>
<tr>
<td>TRLH24</td>
<td>★</td>
<td>★</td>
<td></td>
<td>2x4</td>
</tr>
<tr>
<td>TRLHG24</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>2x4</td>
</tr>
</tbody>
</table>
TRO24/TRO54

VAV Wall Mount Controller

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

BACnet Model

<table>
<thead>
<tr>
<th>Model</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>TROB24T4XYZ1</td>
<td>BACnet</td>
</tr>
</tbody>
</table>

Stand-Alone Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRO24T4XYZ1</td>
<td></td>
</tr>
<tr>
<td>TRO24T4XYZ3</td>
<td>Scheduler</td>
</tr>
<tr>
<td>TRO24-EXT1</td>
<td>Extended setpoint range</td>
</tr>
</tbody>
</table>

Applications

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

TRO54

Stand-Alone Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Analog outputs</th>
<th>TPM/Digital outputs</th>
<th>Sensor inputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRO5404</td>
<td>4</td>
<td>1 TPM</td>
<td>2</td>
</tr>
<tr>
<td>TRO54P3X1</td>
<td>2</td>
<td>3 Digital</td>
<td>2</td>
</tr>
</tbody>
</table>

Inputs

- Al3
  - 3 Analog*
- 24 Vac

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

neptronic.com
**Wall Mount Universal Controller**
Combination controller and room thermostat. Run control wires directly to TUCB unit.

### Models

<table>
<thead>
<tr>
<th>Model</th>
<th>DI*</th>
<th>AI*</th>
<th>BO*</th>
<th>AO*</th>
<th>Sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td>TUCB24C6X2</td>
<td>2</td>
<td>2</td>
<td>6</td>
<td>2</td>
<td>Temp.</td>
</tr>
<tr>
<td>TUHB24C6X2</td>
<td>2</td>
<td>2</td>
<td>6</td>
<td>2</td>
<td>Temp. / Hum.</td>
</tr>
</tbody>
</table>

*Fully configurable for universal applications*

### Inputs
- DI2: 2 Digital
- AI2: 2 Analog* (Universal)
- **Power:** 24 Vac

### Outputs
- DO6: 6 Digital*
- AO2: 2 Analog* 1, 2 or 3* Speed (BO3-BO6) or ECM (AO2)

### Communication
- **BACnet** MS/TP
- Modbus RTU Slave

### Main Features
- Applications: Heat pump, humidity control, CO2 alarms, or general unit controller
- Precise temperature control with programmable PI function
- Selectable internal or external temperature sensor
- External humidity sensor input
- Built-in humidity sensor (TUHB models only)
- Dehumidification sequence compensated by auto activation of reheat output
- Changeover by contact or external temperature sensor
- Compressor anti-cycling delay (configurable)
- Low limit set protection (10°C/50°F)
- Freeze protection
- Occupancy and Night Set Back (NSB) mode
- Real time clock (RTC) with 24-hour backup
- BACnet MS/TP or Modbus communication (selectable)
- 7-day BACnet schedule
- Backlit LCD with simple icon and text driven menus
- Selectable Fahrenheit or Celsius scale
- Manual no occupancy override
- Multi level lockable access menu and setpoint

**neptronic.com**
ARO/AROB Wall Mount Controller

On-board Sensors
- Temperature sensor (°C/°F)
- Humidity sensor (%RH), select models
- Carbon dioxide sensor (CO₂), select models
- VOC sensor (volatile organic compounds), select models

VOC are volatile organic chemicals (indoor air pollutants)

Inputs
- **AI1**: 1 Analog
- **BI1**: 1 Binary*

Outputs
- **BO2**: 2 Binary*
- **AO2**: 2 Analog*
- **ECM**

Communication
- **BAC**
  - MS/TP
- **Modbus**
  - RTU Slave

*Configurable

Stand-Alone Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Temp</th>
<th>RH</th>
<th>CO₂</th>
<th>VOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARO24T</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>ARO24TH</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>ARO24TGH</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>ARO24TGVH</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Networkable Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Temp</th>
<th>RH</th>
<th>CO₂</th>
<th>VOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>AROB24T</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>AROB24TH</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>AROB24TGH</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>AROB24TGVH</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Main Features
- Built-in application profiles to automatically configure the controller for the selected application.
- Up to 4 simultaneous control loops capable of controlling, in real time:
  - Humidification and Dehumidification
  - Heating and Cooling
  - CO₂ levels
  - VOC levels
- Integrated ECM fan control mode
- Displays temperature, %RH, CO₂, VOC, and setpoints
- Display or hide all the required access for user interaction
- Backlit LCD with simple icon and text-driven menus
- Selectable Fahrenheit or Celsius scale
- Precise temperature control with programmable P function
- Independent cool and heat setpoint for No Occupancy
- Configurable proportional control band and dead band
HROB20

Humidity Control
Wall Mount Controller

Inputs

<table>
<thead>
<tr>
<th>DI1</th>
<th>AI3</th>
<th>24 Vac</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Digital (alarm status)</td>
<td>3 Analog</td>
<td></td>
</tr>
</tbody>
</table>

Outputs

<table>
<thead>
<tr>
<th>DO2</th>
<th>AO4</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Digital</td>
<td>4 Analog</td>
</tr>
</tbody>
</table>

Communication

BACnet MS/TP

Wall Mount Humidity Controller
Combination controller and room humidistat. Run control wires directly to HROB unit.

Applications

- Neptronic SKR, SK300, SKE, and SKG humidifiers
- Other humidification and dehumidification applications

Ramps

- **LSS: External Demand Low Signal Selector**
  - Compares selected input signals to select the lowest signal.

- **AER: External Humidity Sensor Averaging**
  - Calculates an average of selected input signals

- **DUC: Duct Supply Input**
  - Two PID loops and a zero/span to smooth out the demand signal

- **DED: External Demand Signal**
  - Control using an external demand of 0-10Vdc or 2-10Vdc

- **HIL: High limit**
  - Compares the demand of the room humidity PID loop with the duct/high limit PID loop and applies the lower of the two.

Main Features

- **BACnet MS/TP** (stand-alone model HRO20 also available)
- 4 analog outputs and 2 dry contact outputs
- External humidity sensor input
- 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
- Backlit LCD with simple icon and text driven menus
- Selectable Celsius or Fahrenheit scale
- Humidification and dehumidification indicator

*Configurable

neptronic.com
Dual Pro I/O Module Expansion Controller

**Models**

<table>
<thead>
<tr>
<th>Type</th>
<th>Model</th>
<th>Buttons</th>
<th>Inputs</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exp. Board</td>
<td>CMMB106</td>
<td>-</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Thermostat</td>
<td>STLD24A</td>
<td>Fan &amp; heat-cool</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Thermostat</td>
<td>STLD24B</td>
<td>Fan &amp; °F/°C</td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>

**Applications**

The CMMB series extends your BACnet or Modbus network when your application requires additional inputs and outputs on a physical controller. The CMMB provides simple expansion of a new or existing controller and reduces unnecessary costs of additional components.

Connected directly to the CMMB106 via Modbus, the STLD24 Modbus RTU LCD Thermostat provides internal and external temperature sensors, LCD display and operational commands without using up a BACnet address.

**Inputs**

- DI2: 2 Digital*
- AI8: 8 Analog* (universal)
- 24 Vac

**Outputs**

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

**Communication**

- **BACnet**: MS/TP
- **Modbus**: RTU Slave

**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

**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

neptronic.com
CMMB IP

IP I/O Module
Expansion Controller

NEW

Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Router</th>
<th>Display</th>
<th>Communication Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>BACnet Ports</td>
</tr>
<tr>
<td>CMMB-IP</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>CMMB-IP-L</td>
<td>-</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>CMMB-IP-R1B</td>
<td>Yes</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>CMMB-IP-R2B</td>
<td>Yes</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>CMMB-IP-RL1B</td>
<td>Yes</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>CMMB-IP-RL2B</td>
<td>Yes</td>
<td>Yes</td>
<td>2</td>
</tr>
</tbody>
</table>

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

Inputs

- BI2
  - 2 Binary Inputs*
- AI8
  - 8 Analog* (universal)

Outputs

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

Communication

- BAC
  - BACnet MS/TP, IP
- Mod
  - Modbus RTU Slave, TCP/IP
- IP
  - Network and Web Services

*Configurable

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

- 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

neptronic.com
CMMB1322

Remote BACnet I/O Board
Input and output expansion board (CMMB)

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)

SMBR

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)
SARB

Networkable IAQ
Room Sensors

Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Temp</th>
<th>RH</th>
<th>CO₂</th>
<th>VOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>SARB24T</td>
<td>☑</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SARB24TH</td>
<td>☑</td>
<td>☑</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SARB24TG</td>
<td>☑</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SARB24TV</td>
<td>☑</td>
<td>☑</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SARB24TGH</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>SARB24TGVH</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
</tr>
</tbody>
</table>

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

Inputs

<table>
<thead>
<tr>
<th></th>
<th>AI1</th>
<th>BI1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 Analog</td>
<td>1 Binary</td>
<td>24 Vac/ 24 Vdc</td>
</tr>
</tbody>
</table>

Outputs

<table>
<thead>
<tr>
<th></th>
<th>BO2</th>
<th>AO2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2 Binary*</td>
<td>2 Analog*</td>
</tr>
</tbody>
</table>

Communication

<table>
<thead>
<tr>
<th></th>
<th>BACnet MS/TP</th>
<th>Modbus RTU Slave</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BACnet® MS/TP or Modbus (selectable via menu)</td>
<td>Select MAC address via menu or via network</td>
</tr>
<tr>
<td></td>
<td>Automatic baud rate detection</td>
<td>Network service port via on-board mini USB connector</td>
</tr>
</tbody>
</table>

*Outputs commandable via network

SAR

IAQ
Room Sensors

Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Temp</th>
<th>RH</th>
<th>CO₂</th>
<th>VOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAR24GH</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>SAR24GV</td>
<td>☑</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

### 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, such as TRO, TFC, EFC and EVC

**STR1: Wall Mount Temperature Sensor**
- Available with 10KΩ or 3.3KΩ thermistor
- High accuracy and stability
- Negative Temperature Coefficient (NTC)
- Compatible with Neptronic products

**STS3: Wall Mount Thermostat**
- Built-in temperature sensor
- Adjustable setpoint with mechanical lock
- Sensor type: 10KΩ or 3.3KΩ
- Scale: Celsius or Fahrenheit

**ITO3: Wall Mount Setpoint Station**
- Adjustable setpoint with mechanical lock
- Scale: Celsius or Fahrenheit
- Compatible with STC8-13 duct mounted temperature sensor in installations with Neptronic series duct heaters

**OTW / SHW: Window Temperature Sensor**
- 10KΩ (SHW0-11) or 3.3KΩ (OTW) temperature sensor
- Self adhesive: sticks directly on window
- SHW0-11 compatible with HROB20 humidistats
- OTW compatible with SKR humidifiers

**STP: Strap-On Water Temperature Sensor**
- 10KΩ Type III Thermistor
- Designed for fan coil 2 pipe changeover applications
- High accuracy and interchangeability over a wide temperature range
- Sensor's higher resistance output compares to platinum Resistance Temperature Detectors (RTD)
- Sensitive to non-polarity
- Temperature range: -40°C to 150°C (-40°F to 302°F)
- Zinc-plated steel enclosure (STP7-11) or ABS plastic enclosure (STP1-11)

**STI1-11: Immersion Water Temperature Sensor**
- 10KΩ Type III Thermistor
- Immersion type temperature sensor
- High accuracy and stability
- Fast thermal response
- Double encapsulation sensor eliminates moisture infiltration
- Machined 5 Brass thermowell
  - ABS plastic enclosure
  - Quick snap latch
- Hinged cover without screws
- Includes 316 stainless steel 3/4” x 1/2” t-tap fitting

neptronic.com
**Sensors**

**Humidity**

**SHC80: Duct Mount Humidity Sensor**
- Duct mounted humidity sensor
- Built-in temperature sensor
- 2 analog outputs (0 - 10 Vdc)
- Can be installed in association with Neptronic room humidistat (HROB20)
- 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)
- Can be installed in association with Neptronic room (HROB20) humidistat or directly to the Neptronic SK300 / SKE Series Steam humidifier (rev 3.3)
- High accuracy and stability

**Window Temperature Sensor**
- 10KΩ (SHW0-11) or 3.3KΩ (OTW) temperature sensor
- Self adhesive: sticks directly on window
- SHW0-11 compatible with HROB20 humidistats
- OTW compatible with SKR humidifiers

**SHC80: Duct Mount Humidity Sensor**
- Duct mounted humidity sensor
- Built-in temperature sensor
- 2 analog outputs (0 - 10 Vdc)
- Can be installed in association with Neptronic room humidistat (HROB20)
- Status LED

**Window Temperature Sensor**
- 10KΩ (SHW0-11) or 3.3KΩ (OTW) temperature sensor
- Self adhesive: sticks directly on window
- SHW0-11 compatible with HROB20 humidistats
- OTW compatible with SKR humidifiers

**HRC20: Room Humidistat**
- Humidity setpoint dial (10-60 %RH)
- Built-in humidity sensor
- 24Vac or 24Vdc
- 1 dry contact output

**SPC: Static Pressure Controller**
- LCD Display
- Simple installation and configuration
- Displays actual pressure reading
- Adjustable setpoint and dead band
- Adjustable response speed
- Selectable output signal
- Direct or reverse action outputs
- Fully calibrated
- Real-time pressure output for remote monitoring

<table>
<thead>
<tr>
<th>Model</th>
<th>Pressure Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPC 0.1</td>
<td>0 to 0.1” w.c.[25 Pa]</td>
</tr>
<tr>
<td>SPC 1.0</td>
<td>0 to 1.0” w.c.[250 Pa]</td>
</tr>
<tr>
<td>SPC 2.0</td>
<td>0 to 2.0” w.c.[500 Pa]</td>
</tr>
<tr>
<td>SPC 5.0</td>
<td>0 to 5.0” w.c.[1245 Pa]</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Model</th>
<th>Pressure Range</th>
<th>Enclosure</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPD00-010</td>
<td>0-1” w.c.[250 Pa]</td>
<td>PCB only</td>
</tr>
<tr>
<td>SPD70-010</td>
<td>0-1” w.c.[250 Pa]</td>
<td>Metal enclosure</td>
</tr>
<tr>
<td>SPD00-020</td>
<td>0-2” w.c.[500 Pa]</td>
<td>PCB only</td>
</tr>
<tr>
<td>SPD70-020</td>
<td>0-2” w.c.[500 Pa]</td>
<td>Metal enclosure</td>
</tr>
<tr>
<td>SPD00-050</td>
<td>0-5” w.c.[1245 Pa]</td>
<td>PCB only</td>
</tr>
<tr>
<td>SPD70-050</td>
<td>0-5” w.c.[1245 Pa]</td>
<td>Metal enclosure</td>
</tr>
</tbody>
</table>
CVC
• 24Vac or 24 Vdc supply
• 2 or 4 SPDT relays
  (staged or sequenced operation)
• Voltage or current input
• Menu-driven LCD
• 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 clamp terminals

<table>
<thead>
<tr>
<th>Model</th>
<th>Relays</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVC002</td>
<td>2</td>
</tr>
<tr>
<td>CVC004</td>
<td>4</td>
</tr>
</tbody>
</table>

MEP: Manual Electronic Positioner
• Variable or fixed position controller
• Simple installation
• Wall or panel mounted
• Stainless steel faceplate

SCC80: Changeover Control Sensor
• 24Vac or 24 Vdc supply
• Sensor operation temperature up to 176°F [80°C]
• 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
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

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

- **D-B-S**
  - Up to 70 in.lbf (8 Nm)
- **L-T-R**
  - Up to 360 in.lbf (16 Nm) to 360 in.lbf (40 Nm)
- **U & W**
  - Up to 4000 in.lbf (200 Nm) to 4000 in.lbf (450 Nm)
- **B-T-R**
  - Running time of 1.5 sec to 30 sec

**Actuated Valves**

- **Smoke Damper**
  - BTX-LTX
  - Rated at 250°F (121°C)
- **Outdoor**
  - IP65
  - High humidity and outdoor applications
- **Linear**
  - A-M-V
  - Zone and globe valve applications

---

**Contoured Port Ball**

**Full Port Ball**

**Industrial Ball**

**Butterfly**

**Zone**

**Globe**

**Retro Fit**
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 TRL54 or TRL24 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

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MANUFACTURER OF

- HVAC CONTROLS
- ELECTRIC ACTUATORS
- ACTUATED VALVES
- HUMIDIFIERS
- ELECTRIC HEATERS

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