Comfort Controller 1600
(Outdoor Duty Rated)

The Comfort Controller 1600 is a microcontroller-based module that provides general purpose HVAC control and monitoring capability in a stand-alone or network environment using closed-loop, direct digital control. The 1600 gives the Carrier Comfort Network (CCN) the capability to control and communicate with non-Carrier equipment and Carrier HVAC equipment not equipped with Product Integrated Controls (PIC) controls.

You can connect 16 field points (8 inputs and 8 outputs) to this controller.

FEATURES

• Stand-alone control and monitoring of up to 16 field points, using proven algorithms.
• Compatibility with all standard CCN user interfaces.
• Two LEDs, conveniently located on the front of the module, indicate processor status (red), and CCN Communication Bus status (yellow).
• Entire database at your disposal. Based on your application's requirements, you determine how many and which algorithms, inputs/outputs, schedules, alarms, and system functions to include in the database. Therefore, the database will only consist of the items that are necessary for the application — valuable memory space is not wasted.
• Ability to display the amount of available database space.
• Ability to add items to database as necessary.
• Local connection for LID and CCN.
• Total facilities management when linked to a CCN.
• Two-day backup of clock and data such as Data Collection and Runtime.
• No need for batteries.

FUNCTIONS

Cooling and Heating Control
Space Temperature Comfort Zone
Humidification and Dehumidification
Mixed Air Damper Optimization
VAV Fan Control
VAV Supply and Return Fan Tracking
Indoor Air Quality
Generic PID Control
Time Scheduling with/without Override

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### 8 INPUTS

<table>
<thead>
<tr>
<th>Numbers</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 4</td>
<td>Discrete or analog (0-10 Vdc)</td>
</tr>
<tr>
<td>5 &amp; 6</td>
<td>Temperature</td>
</tr>
<tr>
<td>7 &amp; 8</td>
<td>Discrete, analog, or temperature</td>
</tr>
<tr>
<td></td>
<td>Discrete</td>
</tr>
<tr>
<td></td>
<td>Dry contact</td>
</tr>
<tr>
<td></td>
<td>Pulsed dry contact</td>
</tr>
<tr>
<td></td>
<td>Analog</td>
</tr>
<tr>
<td></td>
<td>4-20 mA</td>
</tr>
<tr>
<td></td>
<td>0-10 Vdc</td>
</tr>
<tr>
<td></td>
<td>Temperature</td>
</tr>
<tr>
<td></td>
<td>5K &amp; 10K ohm thermistors</td>
</tr>
<tr>
<td></td>
<td>1K ohm nickel RTD</td>
</tr>
</tbody>
</table>

### 8 OUTPUTS

<table>
<thead>
<tr>
<th>Numbers</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 4</td>
<td>Discrete</td>
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<tr>
<td>5 &amp; 6</td>
<td>Analog</td>
</tr>
<tr>
<td>7 &amp; 8</td>
<td>Discrete or analog</td>
</tr>
<tr>
<td></td>
<td>Discrete</td>
</tr>
<tr>
<td></td>
<td>24 Vdc@80 mA</td>
</tr>
<tr>
<td></td>
<td>Analog</td>
</tr>
<tr>
<td></td>
<td>4-20 mA</td>
</tr>
<tr>
<td></td>
<td>0-11 Vdc (varies with point type)</td>
</tr>
</tbody>
</table>
Analog Temperature Control
Discrete Interlock
Staged Thermostat
Proportional Thermostat
Primary/Secondary Pump Control
Staged Discrete Control
Permissive Interlock
Night Time Free Cooling
Morning Warm-up
Adaptive Optimal Start/Stop
Control Point Reset
On-Board Consumable Point
Calculates a usage value (kwh, gal/hr, lbs/hr, etc.) in applications where simple data collection is required.
On-Board Trending
Collects up to 60 data samples per point (with an adjustable iteration rate) on a revolving basis, or stops the trending after 60 samples are collected. Use as a means of troubleshooting.
Linkage to Airside (TSM) and Waterside (WSM) Systems
Optimizes efficiency by fully integrating all HVAC operations (DAV).
Custom Programming (BEST++)
Enhances or supplements the industry-proven, pre-engineered algorithms with BEST++ by creating new algorithms to meet any unique control requirements.

CCN FEATURES
When included in a network with other CCN controllers, Option Modules, and user interfaces, the following additional capabilities are possible:
• Alarm processing, messages, and annunciation.
• Runtime, history, and consumable data collection and report generation.
• Demand limiting/loadsheding.
• Broadcast of data such as outside air temperature, outside air humidity, and time of day.
• Data transfer between system elements.
• Timed overrides for use with Tenant Billing.
• Airside and waterside linkage.

ENCLOSURE AND POWER SUPPLY
The 1600 is designed so that it can be easily installed in a field-supplied NEMA-3R enclosure.
The 1600 uses any standard, Class II, SELV-compatible, field-supplied 24 Vac, 60 VA transformer.

SPECIFICATIONS
Power Requirements .............. 60VA @ 24 Vac ± 15%
1.5A @ 33 Vdc ± 15%
Dimensions ................. 13 in H x 2.75 in W x 5.5 in D
(33 cm x 7 cm x 14 cm)
Operating Temperature .............. -40°F to 158°F
(-40°C to 70°C)
Storage Temperature .............. -40°F to 185°F
(-40°C to 85°C)
Operating Humidity .............. 0 to 90%, non-condensing

Discrete Out Specifications
Output Signal ................. 24 Vdc @ 80 mA current limited

Analog Out Specifications
4-20 mA Milliamp Type
Load Resistance ..................... 0-600 ohms
Resolution ......................... 0.085 mA
Accuracy ......................... ±2%
0-11 Vdc Voltage Type (varies with point type)
Load Resistance ..................... >50,000 ohms
Resolution ......................... 50 mV
Accuracy ......................... ±2%

Discrete In Specifications
Dry Contacts ......................... Switch Closure
Pulsing Dry Contacts
Repetition Rate ..................... 5 Hz max.
Minimum Pulse Width .............. 100 msec

Analog In Specifications
4-20 mA Milliamp Type
Wire type .......................... 2-wire
Resolution ......................... 0.025 mA
Accuracy ......................... ±1%
0-10 Vdc Voltage Type
Resolution ......................... 0.0125 V
Accuracy ......................... ±1%
5K Thermistor Type
Nominal reading @ 5,000 ohms ........ 77°F (25°C)
Resolution ......................... 0.1°F
Accuracy ......................... ±1°F
10K Thermistor Type
Nominal reading @ 10,000 ohms ........ 77°F (25°C)
Resolution ......................... 0.1°F
Accuracy ......................... ±1°F
Nickel RTD Type
Nominal reading @ 1,000 ohms ........ 70°F (21°C)
Resolution ......................... 0.1°F
Accuracy ......................... ±2°F

The 1600 is UL 916 PAZX, VDE, ULC, and CE Mark listed.