Comfort Controller 1600

The Comfort Controller 1600 (part number CEPL130202) is a microcontroller-based module that provides general purpose HVAC control and monitoring capability in a standalone 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
- Analog Temperature Control
- Discrete Interlock

### 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 thermists</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>
</tr>
<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>
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/loadshedding.  
- 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-1 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 .................. 32°F to 140°F  
(0°C to 60°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.