

## Comfort Controller 1600

The Comfort Controller 1600 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 the following interface devices: Local Interface Device (LID), ComfortWORKS, Building Supervisor III, System Access Module (SAM), and Network Service Tool III.
- 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



8 INPUTS	
Numbers	Specifications
1 to 4	Discrete or analog (0-10 Vdc)
5 & 6	Temperature
7 & 8	Discrete, analog, or temperature
	Discrete
	Dry contact
	Pulsed dry contact
	Analog
	4-20 mA
	0-10 Vdc
	Temperature
	5K & 10K ohm thermistors
	1K ohm nickel RTD
8 OUTPUTS	
Numbers	Specifications
1 to 4	Discrete
5 & 6	Analog
7 & 8	Discrete or analog
	Discrete
	24 Vdc@80 mA
	Analog
	4-20 mA
	0-10 Vdc

- 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 and Waterside Systems**

Optimizes efficiency by fully integrating all HVAC operations.

**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  $\pm$  15%  
1.5A@33 Vdc  $\pm$  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 .....  $\pm$ 2%
- 0-10 Vdc Voltage Type
  - Load Resistance ..... >50,000 ohms
  - Resolution ..... 50 mV
  - Accuracy .....  $\pm$ 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 .....  $\pm$ 1%
- 0-10 Vdc Voltage Type
  - Resolution ..... 0.0125 V
  - Accuracy .....  $\pm$ 1%
- 5K Thermistor Type
  - Nominal reading @ 5,000 ohms ..... 77°F (25°C)
  - Resolution ..... 0.1°F
  - Accuracy .....  $\pm$  1°F
- 10K Thermistor Type
  - Nominal reading @ 10,000 ohms ..... 77°F (25°C)
  - Resolution ..... 0.1°F
  - Accuracy .....  $\pm$  1°F
- Nickel RTD Type
  - Nominal reading @ 1,000 ohms ..... 70°F (21°C)
  - Resolution ..... 0.1°F
  - Accuracy .....  $\pm$ 2°F

The 1600 is UL 916 PAZX, UL 864 UDTZ, VDE, ULc, and CE Mark listed.