

## Comfort Controller 6400

The Comfort Controller 6400 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 6400 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 the 6400. To connect additional field points, add optional input/output modules (8 inputs and 8 outputs per I/O module) to the 6400. By using multiple I/O modules, you can connect up to 48 additional points, giving you the capability to control and/or monitor a total of up to 64 field points. The appropriate number of I/O modules are selected for each control situation and simply installed along with the 6400 in your field-selected NEMA-1 enclosure. This modular concept contributes to overall versatility and ease of installation. The Comfort Controller 6400 includes a diverse library of performance-proven control routines, written in plain English, using simple "fill-in-the-blanks" format for fast, easy programming. Additionally, for custom applications, Carrier's BEST++ software provides custom programming capabilities to work independently, or in conjunction with the pre-engineered control routines.

### FEATURES

- Stand-alone control and monitoring of up to 16 field points, using proven algorithms.
- Support of the UT203 FID family of I/O modules for retrofit and upgrade applications.
- Compatibility with the following interface devices: Local Interface Device (LID), ComfortWORKS, Building Supervisor III, System Access Module (SAM), and Network Service Tool III.
- Three LEDs, conveniently located on the front of the module, indicate processor status (red), CCN Communication Bus status (yellow), and I/O module communication status (green).
- 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.



8 INPUTS	
Numbers	Specifications
1 to 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 8	Discrete or analog Discrete 24 Vdc@80 mA Analog 4-20 mA 0-10 Vdc

- 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.
- Ability to disable all inputs, all outputs, or disable both inputs and outputs by simply flipping a switch.
- Two-day backup of clock and data such as Data Collection and Runtime.
- Simplified field wiring using "plug type" terminals (two-pin connection).
- No need for batteries.
- Optional Comfort Controller 6400-HOA (Hand-Off-Auto) consisting of eight switches that provide you with the capability to manually override each discrete output point.
- Uses any standard, field-supplied 24 Vac, 60VA transformer.

## 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  
 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 48 data samples per point (with an adjustable iteration rate) on a revolving basis, or stops the trending after 48 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.

## Comfort Controller 6400-I/O

The Comfort Controller 6400-I/O is used with the Comfort Controller 6400 to expand the field point capacity from 16 points (8 inputs and 8 outputs) up to a total of 64 points.

Each 6400-I/O can be configured to use all 16 points (8 inputs and 8 outputs) or only 8 outputs or only 8 inputs. This provides the ultimate flexibility in useage of field points to meet the specific needs of each application. Determine the number of 6400-I/O required for your particular application. Then simply install the modules along with the 6400 in your field-selected NEMA-1 enclosure.

To determine the number of 6400-I/O required by the particular application, first decide how many field points are required. Then order and install the 6400-I/O(s) along with the 6400 in your field-selected enclosure. This modularity contributes to overall versatility.

### FEATURES

- Monitors up to 16 field points.
- Two LEDs, conveniently located at the top of the module, indicate processor status (red) and module communication status (green).
- Local connection for LID.
- Ability to disable all inputs or all outputs by simply flipping a switch.
- Simplified field wiring using "plug type" terminals (two-pin connection).
- Optional Comfort Controller 6400-HOA (Hand-Off-Auto) consisting of eight switches that provide you with the capability to manually override each discrete output point.



<b>8 INPUTS</b>	
Numbers	Specifications
1 to 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
<b>8 OUTPUTS</b>	
Numbers	Specifications
1 to 8	Discrete or analog Discrete 24 Vdc@80 mA Analog 4-20 mA 0-10 Vdc



# COMFORT NETWORK

## PRODUCT DATA

### SPECIFICATIONS —

#### Comfort Controller 6400 and Comfort Controller 6400-I/O

Power Requirements ..... 60VA@24 Vac  $\pm$  15%  
 1.5A@33 Vac  $\pm$  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 ..... 24Vdc@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 6400 and 6400-I/O are UL 916 PAZX, UL 864 UDTZ, VDE, ULc, and CE Mark listed.

### ENCLOSURE AND POWER SUPPLY

The 6400 and 6400-I/O are designed so that they can be easily installed in a field-supplied NEMA-1 enclosure.

The 6400 and 6400-I/O use any standard, Class II, SELV-compatible, field-supplied 24 Vac, 60 VA transformer.