Comfort Controller 6400 (Outdoor Duty Rated)

The Comfort Controller 6400 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 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 (PICs).

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-3R 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 and subsequent versions, System Access Module (SAM), and Network Service Tool III and subsequent versions.
- 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 data-

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base. 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.
- 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.
- 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
(Outdoor Duty Rated)

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 usage 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-3R 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).

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SPECIFICATIONS —
Comfort Controller 6400 and
Comfort Controller 6400-I/O

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 ............... 24Vdc@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 6400 and 6400-I/O are UL 916 PAZX, 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-3R enclo-
sure.
The 6400 and 6400-I/O use any standard, Class II,
SELV-compatible, field-supplied 24 Vac, 60 VA
transformer.

Note: Optional Comfort Controller 6400 HOA (Hand-Off-Auto) is not outdoor duty rated.