

ZonexCommanderâ

Thermostat Management System

Model #:

101COMC – Command Center

DIGICOM - Digital communicating thermostat

SENDCOM- Communicating duct temperature sensor

RLYCOM- Communicating relay module

101MUX- Four channel multiplexer

Part 1 - General

1.01 SYSTEM DESCRIPTION

The system shall consist of a multiple zone capacity programmable controller and communicating thermostats. Each controller shall communicate with up to 20 devices total. Up to four controllers may be networked together to communicate with up to 80 devices total. Each controller shall also include a complete set of air temperature sensors. The system control devices shall be capable of a stand-alone application, or as a multiple zone system networked in a communication bus. The system components shall provide the capability to be accessed locally and remotely through use of a Windows® based computer.

1.02 QUALITY ASSURANCE

The controls system shall be designed to conform to UL and CSA standards.

1.03 STORAGE AND HANDLING

The system control products shall be stored and handled per manufacturer's recommendations.

1.04 INSTALLATION

A. General:

The control system equipment and connecting wiring shall be installed in a neat professional manner and in accordance with all national and local electrical codes.

B. Qualification of installing contractor:

The contractor shall be licensed to properly install the specified control system.

C. Control Wiring:

1. All control wiring in connection with the temperature control system shall be furnished by the installing contractor and in accordance with manufacturer's requirements, and all applicable national, state and local codes.

2. All control wiring installed in mechanical or electrical equipment rooms and all exposed wiring shall be installed in a suitable raceway.

D. Programming:

1. Assist with the installation and set up of owner provided computers, phone connections and start-up including loading of software and operator use of system.
2. Program all applicable fields for thermostat scheduling as required to suit building owners requirements.
3. Coordinate with owner for naming of all thermostats and devices, as related to areas or rooms being served.

Part 2 – Products

2.01 EQUIPMENT

A. General:

The control system shall be available as a complete package, with the required software, input sensors, communicating thermostats and optional relay modules. It shall provide complete control of the communicating thermostats in stand-alone and zoning applications through a single communication bus. The control system shall support not less than 20 individual thermostats or devices. Stand-alone thermostat use shall provide not less than two heat and two cool stages with independent fan control.

B. Memory and Timing reference:

The system components shall operate without use of an external time clock. In the event of power loss, all program schedules shall be retained indefinitely in non-volatile memory. The calendar date and time shall remain uninterrupted during power loss. The system shall restart and resume normal operation upon power restoration.

C. Stand-Alone capability:

The system shall be capable of operating stand-alone systems entirely, or integrated with zoning systems. The system shall not require a computer to prompt any functions for normal operation.

The system shall be capable of interface to a computer either remotely or locally for purposes of diagnostics, programming and monitoring. The system shall be capable of monitoring and displaying both supply and return air temperatures from each stand-alone HVAC unit.

D. 101COMC Command Center:

1. The controller shall communicate with up to 20 devices total, to include DIGICOM series communicating thermostats and RLYCOM communicating relay modules.
2. The controller shall be capable of establishing, adjusting and storing both an occupied and unoccupied schedule in a 5-1-1 or seven-day format. Scheduling increments shall be in one-minute intervals, with four program periods available.
3. The controller shall schedule individual or global thermostat set points for each mode.
4. The controller shall provide individual thermostat name assignments up to 20 characters each.
5. The controller will provide the ability to monitor and display at the operating computer: outside air, return air and mixed air temperatures for each HVAC unit in the system individually.
6. The controller shall offer an air sensor for supply, return and outside air temperatures. Calibration of the system sensors shall be adjustable from the controller without requiring the sensor to be taken out of service.
7. The controller shall display up to twenty thermostats or devices concurrently. Each thermostat or device listing shall display a numerical and descriptive identification, occupied and unoccupied heating and cooling set points with additional diagnostic information. Diagnostic information shall include set point lock status, mode of operation, space temperature, date and time of day.

8. Provide print capability of all occupied and unoccupied heating and cooling set points with diagnostic information
9. Provide print capability of individual or global thermostat schedules.
10. The controller shall provide individual or global temporary mode overrides (Occupied or Unoccupied) of the thermostat schedule. Upon the next event time, the thermostat will revert to its programmed schedule.
11. The controller shall provide up to 20 holiday schedules with up to 31 days per schedule.

E. DIGICOM thermostat:

1. Each thermostat shall support stand-alone unit and zone control capabilities.
2. Each thermostat shall be capable of controlling two heat and two cool stages with independent fan operation.
3. Each thermostat shall provide a cooling minimum run time of 120 seconds upon stage initiation.
4. Each thermostat shall provide time and temperature conditions to inhibit second stage operation.
5. Each thermostat shall provide a 5 minute minimum off delay to prevent cooling equipment short cycling.
6. Each thermostat shall provide a continuous fan function during the occupied mode of operation.
7. Each thermostat shall provide LED indication of the thermostat stage demand.
8. Each thermostat shall have the ability to automatically change-over between heat and cool modes.
9. Each thermostat shall receive command to lock set points and all thermostat functions through the operating software, without use of manual jumpers or dip switches.
10. Each thermostat shall provide a continuous illuminated temperature display.
11. Each thermostat shall provide a mode override function (Occupied / Unoccupied) locally at the thermostat.

F. DIGIHP thermostat:

1. Each thermostat shall support stand-alone unit and zone control capabilities.
2. Each thermostat shall be capable of controlling three heat and two cool stages with independent fan operation.
3. Each thermostat shall provide a cooling minimum run time of 120 seconds upon stage initiation.
4. Each thermostat shall provide time and temperature conditions to inhibit second and third stage heating operation.
5. Each thermostat shall provide time and temperature conditions to inhibit second stage cooling operation.
6. Each thermostat shall provide a 5 minute minimum off delay to prevent cooling equipment short cycling.
7. Each thermostat shall provide a continuous fan function selectable at the thermostat.
8. Each heat pump thermostat shall provide an emergency heat function to lock out compressor operation in the heat mode.
9. Each thermostat shall provide LED indication of the thermostat stage demand.
10. Each thermostat shall have the ability to automatically change-over between heat and cool modes.
11. Each thermostat shall receive command to lock set points and all thermostat functions through the operating software, without use of manual jumpers or dip switches.
12. Each thermostat shall provide a continuous illuminated temperature display.
13. Each thermostat shall provide a mode override function (Occupied / Unoccupied) locally at the thermostat.

G. SENCOM Remote communicating duct temperature sensor:

1. The duct sensor shall be capable of broadcasting two duct air temperatures for each stand-alone thermostat application.
2. The duct sensor shall be capable of broadcasting two duct air temperatures for each additional zone controller installation.
3. The duct sensor shall provide a selectable address to coincide with its respective stand-alone thermostat address.
4. The duct sensor shall integrate with the system without any software editing.

5. The SENCOM remote duct temperature sensor shall connect into the communications bus at any point within the link.

H. RLYCOM Communicating relay module:

1. Each relay module shall provide generic device scheduling using on/off logic, up to four events per day.
2. All event schedules shall be available to be entered in one minute increments.
3. Each relay module shall provide 2-SPDT dry relay contacts for pilot duty switching applications.
4. Each relay module shall be capable of broadcasting operating modes (Occupied and Unoccupied) locally and at the operating computer.
5. Each relay module shall provide a local mode override function to alternate between operating modes without use of a computer.
6. Each relay module shall provide a unique address to identify the device when queried by the controller.

I. 101MUX- 4 channel multiplexer:

1. One multiplexer switching device shall support communication with up to four 101COMC Command Centers.
2. Each multiplexer shall support local and remote communication options with the operating computer.
3. Provide LED indication of the active communicating channel.

J. System Coordination Capabilities

1. The 101COMC Command Center shall have a communication range of up to 20 thermostats, using a RS-485 communication bus.
2. The 101MUX multiplexer shall facilitate communication with up to four 101COMC Command Centers. Utilizing a separate RS-232 connection for each Command Center, the 101MUX shall provide communication with up to 80 devices total.
3. The 101COMC shall have the ability to perform a communication check to identify all system thermostats. The check shall identify their unique device identification addresses, regardless of a communication error.

4. The 101COMC shall have the ability to transmit and receive data from its system thermostats to energize their respective outputs.

2.02 SEQUENCE OF OPERATION

The ZonexCommander® System will control the communicating thermostats in the following manner:

- A. The DIGICOM / DIGIHP thermostats will communicate with the 101COMC Command Center on a communication bus network.
- B. The DIGICOM / DIGIHP thermostat shall determine the heating or cooling demand based upon the programmed set points and space temperature deviation.
- C. When the room ambient is equal to or greater than a 2.0° F. deviation from the thermostat set point, the thermostat will energize the first stage of that specific mode.
- D. Upon a continued set point deviation of 3.0° F. or greater, the second stage of the specific mode will be energized. When the demand recovers to 2.0° F. or less from set point, the second stage is released. When the demand recovers to 1.0° F. or less from set point, the first stage is released.
 1. DIGIHP heat pump thermostat only: When the room ambient is 4.0° F or greater from the thermostat set point, the thermostat will energize the third heat stage. When the demand recovers to within 3.0° F. from set point, the stage will be released.

2.03 SOFTWARE

- A. Access to the system, whether local or remote, shall be accomplished using the Zonex Systems ZonexCommander Software.
- B. The software shall be capable of, but not limited to: listing all thermostat numerical and descriptive identification, occupied and unoccupied operational modes, heating and cooling set points and current room temperatures to include diagnostic information. Diagnostic information for each communicating thermostat shall include set point lock status, thermostat mode and space temperature indication. Diagnostic information for each system shall include supply air, return air and mixed air temperatures, date and time of day reference.

- C. The software shall be capable of providing monitoring and modifying system configurations for all components.

2.04 SERVICE AND WARRANTY

- A. Upon completion of installation, the system shall be start up and initial programming completed. The equipment being operated by the specified control system shall be in operation and fully checked. The entire system must be in operation for a period of 24 hours prior to seeking acceptance from the owner/engineer.
- B. The control system herein specified shall be free from defects in workmanship and material under normal use and service. If, within 24 months from date of acceptance by owner/engineer, any of the control equipment herein described is proved to be defective in workmanship or material, the control equipment manufacturer shall provide a replacement component free of charge.