CLIMATEWORX

MISSION CRITICAL CLIMATE CONTROL

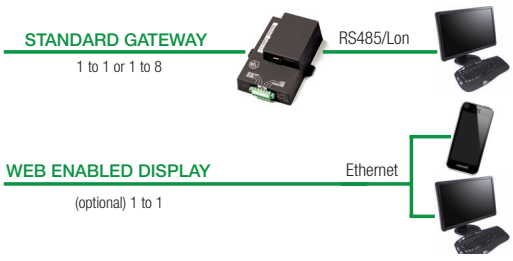
ADVANCED M52 CONTROLLER

FEATURING CO-WORK™

Co-Work™ capabilities of up to 16 members with 32 stages of cooling.

Co-Work™ #1
Up to 16 members

Co-Work™ #2
Up to 16 members



Please contact us to see how ClimateWorx International can help you reach your design objectives:

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ADVANCED M52 CONTROLLER | WITH CO-WORK™

CO-WORK™ FUNCTIONS

CONTROL REDUNDANCY

Co-Work™ allows multiple master units to coexist on the same network. In case any master requires service, the remaining units will automatically take over control of the whole system. In the event of a controller failure, control will be transferred automatically to the other masters minimizing loss of system control and down time.

EXPANSION OF CONTROL STEPS

Co-Work™ improves the system performance by utilizing the limited number of control steps in individual units and converts them to 16 steps or up to a maximum of 32 steps for dual compressor members. This provides more precise control and limits on/off cycles by matching capacity to load.

CONTROL VALUE AVERAGING

Co-Work™ exchanges sensor readings (temperature and humidity) from network units and operates from the average value. This prevents units from fighting each other when multiple units control one space.

SEQUENTIAL LOAD ACTIVATION

Co-Work™ coordinates the activation and deactivation of components in a unit and within a group of units to minimize in-rush current

DATA SYNCHRONIZATION

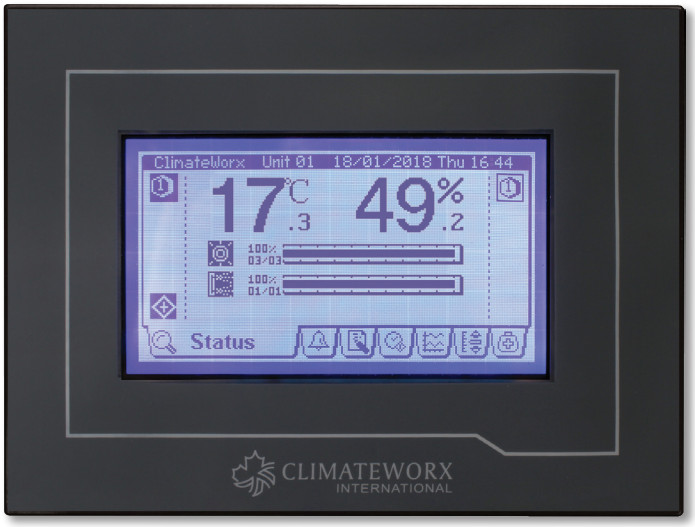
Unit operation data such as set points, time schedule, alarm status is synchronized among units under the same Co-Work™ network.

TWO LEVELS OF DUTY SHARING

The first level maintains the required number of duty units in the network and automatically sequences duty and redundant units on to even out run time. This function is time based and is factory set for 24hrs. This value is adjustable. The second level of duty sharing automatically initiates lead/lag sequence of the components among the duty units to equalize run time. Co-Work™

CO-WORK™ CONNECTIVITY

Our controller is at the heart of all of ClimateWorx' product intelligence. Co-Work™ is based on a unique multi-master network system designed by ClimateWorx to maximize performance, reliability and manageability of our precision air conditioning systems. Its six key control functions guarantee the highest possible degree of on-site connectivity utilizing built-in IIC communication bus. An optional remote mounted panel allows for remote monitoring and control in a LAN environment. Common alarm output can be used for automatic dial-up to an emergency service response unit for remote sites.



PROCESS STATUS & OPERATION ICONS

- Heating
- Free Cooling (3rd bar when active)
- Programmed timer schedule auto on/off
- Dehumidifying
- Remote on/off (via switch input)
- Co-Work™ Address
- Cooling
- Local on/off control (via control panel)
- Network Address
- Humidifying
- Standby start back up start mode

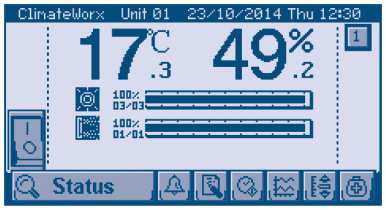
POSSIBLE ALARM CONFIGURATION OPTIONS:

- Enable option key - alarm will only be monitored if this option is selected.
- Unit shut down option key - if this option is selected, unit will be automatically shut down under alarm condition.
- Stand by enable option key - if this option is selected, standby enable output will be activated under alarm condition.
- Common alarm option key - if this option is selected, common alarm output will be activated under alarm condition.
- Audible warning option keys - provide selection of three different audible warning sounds.
- Event log option key - if this option is selected, the alarm events will be logged in the historical event/log.

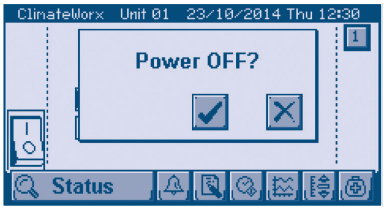
TEST MODE CONFIGURATION & MANUAL OVERRIDE CONTROL:

- Switched input / output opened.
- Switched output closed under override control.
- Switched output opened under override control.
- 070% Analogue output in percentage.
- Switched input / output closed.
- 090% Analogue poutput in percentage under override control.

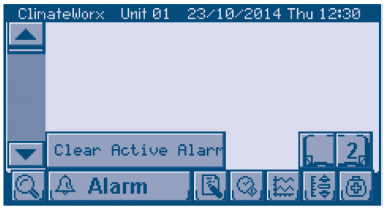
OPERATING STATUS DISPLAY



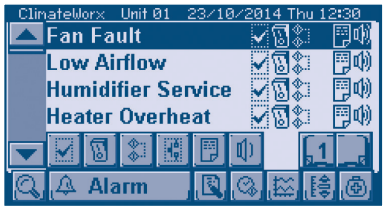
UNIT SHUT DOWN



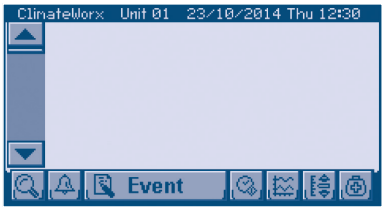
ACTIVE ALARM DISPLAY



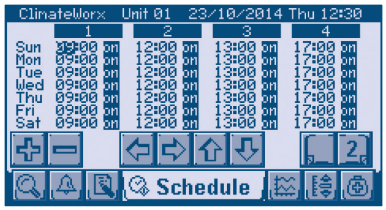
CUSTOMIZE ALARM CONFIGURATION



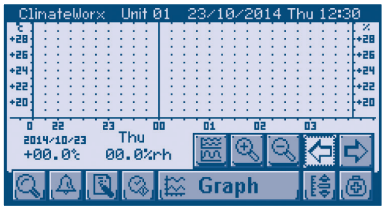
50 HISTORICAL EVENT LOG



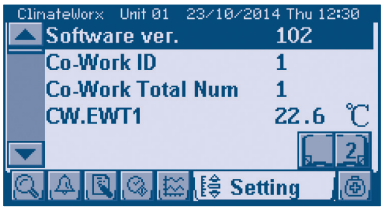
TIMER ON/OFF MODE



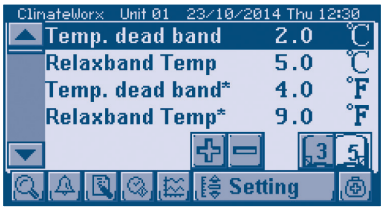
LATEST 24 HOUR TEMPERATURE & HUMIDITY



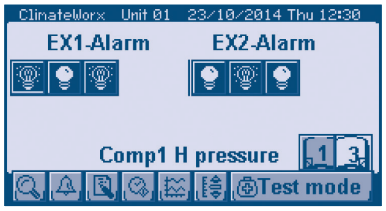
SETTINGS



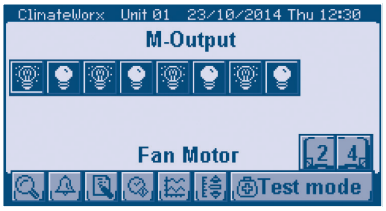
SETTINGS



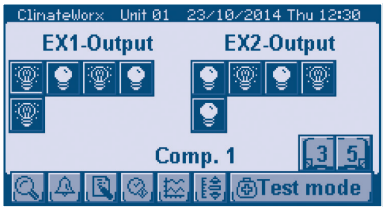
EXPANSION BOARD DIAGNOSTIC



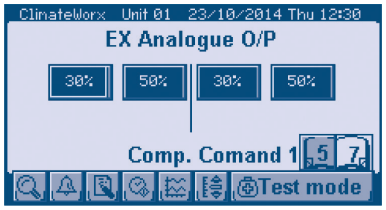
DIAGNOSTIC MAIN BOARD



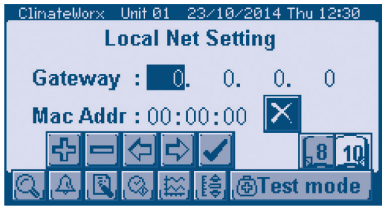
STATUS EXPANSION BOARD



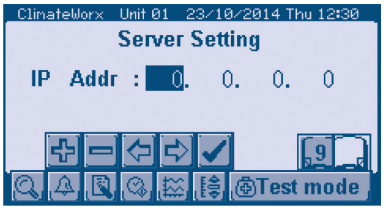
STATUS EXPANSION BOARD



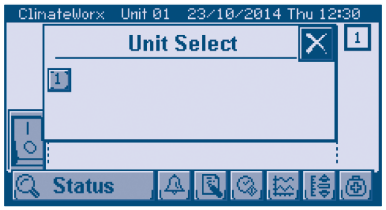
LOCAL NETWORK SETTING



SERVER SETTING



CO-WORK ADDRESS



ADVANCED M52 CONTROLLER

GUIDE SPECIFICATIONS

1.1 The unit shall have a microprocessor based control system with automatic control and monitoring capability.

1.2 The control system shall use a Proportional + Integral + Derivative (PID) control algorithm to maintain the temperature and humidity to a close tolerance of ±0.5 C and 3% RH.

1.3 The control system shall have a fascia with 240x128 dot resolution touch screen graphical CD display located on the front panel of the unit for the display & programming of functions.

1.4 The control system shall display simultaneously the following information on the fascia.

- Room temperature in C/°F
- Room humidity in %RH
- Network Address no.
- Co-Work™ Unit no.
- On/Off mode indicator
- Operating status
- Active alarms
- Date & time

1.5 System configuration and setting shall be stored in non-volatile memory and safeguarded in the event of power failure.

1.6 The system shall have at least three levels of programmable password access to prevent unauthorized changes of the system configuration and settings.

1.7 The control system shall have a built-in testing routine to simplify field testing and troubleshooting.

1.8 The system shall be capable of communicating with a Building Management System (BMS) Network, via a RS485 serial link through a BMS Interface (Gateway / Communications Bridge) for remote monitoring function.

CONTROL FEATURES

2.1 System set-points and configuration shall be programmable only when access is gained by entering the correct password.

2.2 The following programmable control parameters shall be provided for fine tuning the system to suit the site conditions and requirements:

- Temperature set point
- Supply or return control
- Temperature high limit
- Temperature low limit
- Cooling proportional band
- Heating proportional band
- Temperature dead band
- Relax temperature dead band
- Temperature integral action time
- Humidity set point
- Humidity high limit
- Humidity low limit
- Humidifying proportional band
- Dehumidifying proportional band
- Humidity dead band
- Relax humidity dead band
- Humidity integral action time

2.3 The control system shall have the following programmable On/Off control mode options:

- "Local" mode allows unit on/off control via the "I/O" key on the display
- "Remote" mode allows unit On/Off control via a switched input
- Timer" mode allows 4 event/day weekly automatic on/off control

2.4 A "Standby unit enable" input shall be provided to force the unit to start irrespective of the current On/Off status and On/Off mode setting.

2.5 For energy saving and extended system life, a "Relax" feature shall be provided in the "Timer" On/Off mode to allow wider temperature and humidity tolerances when the room is not operational. The system shall have programmable, manual, or automatic restart option. A programmable startup delay shall be provided for the automatic restart option which allows multiple units to restart progressively when power resumes after a power failure.

2.6 The accumulated runtime of the following components shall be logged for energy analysis ad planned maintenance:

- Fan
- Compressor
- Heaters
- Humidifier

2.7 Components shall be scheduled to activate sequentially to minimize in rush current.

2.8 The system shall have a temperature and humidity graph which shows the main temperature and humidity variation in the latest 24 hours. The data for the graph shall be logged in 15 minute intervals.

ALARMS

3.1 The control systems shall have the following standard alarms:

- High/Low temperature, 1 & 2
- High/Low humidity, 1 & 2
- High/Low voltage
- Filter dirty
- Fan overload
- Low airflow
- Compressor high pressure, 1 & 2
- Compressor low pressure, 1 & 2
- Heater overheat
- Humidifier service
- Fire
- Liquid detection
- Liquid high limit
- Power phase loss
- Sensor communication lost
- Filter drier dirty

3.2 All alarms shall have programmable reporting/ response options which include:

- Polling enable / disable
- Unit shutdown
- Activate standby unit
- Activate common alarm output
- Log alarm event
- 4 warning sound selection

3.3 Alarm messages, when programmed, shall comprise text description and occurrence time. Messages shall be ranked in the sequence of occurrence for fault analysis.

3.4 When a programmed alarm condition exists, the audible alarm shall sound and the common alarm output shall close until acknowledged. Active alarm record shall remain until the alarm condition is cleared.

3.5 A historical event log which maintains the latest 50 system events shall be provided. The test description and occurrence time of the following events shall be logged:

- Power failure
- Power restore
- Unit start
- Unit stop
- Alarm raised
- Alarm acknowledged
- Alarm cleared

CO-WORK™, MULTIPLE UNITS CONFIGURATION

4.1 The units shall have built-in master and slave inter-networking capability, Co-Work™ which allows a combination of a maximum of 16 master or slave members to form a local area network.

4.2 To achieve the tightest control tolerance and minimize component on/off, the units shall have a built in control step expansion algorithm which uses a multi-step control scheme to co-ordinate the on/off of cooling, heating, humidifying and dehumidifying steps in multiple units.

4.3 The units shall have a sequential load activation control algorithm to minimize the inrush current when components among multiple units are activated at the same time.

4.4 The control of a slave circuit shall not be limited to any particular master unit. Any master unit can control any slave. In case of a master unit failure or scheduled service, the remaining master units in the same network shall automatically take over the control.

4.5 The units shall have a duty sharing control algorithm which helps maintain the required number of duty units and balancing runtime by automatically coordinating units on/off and providing time based auto-changeover.

4.6 The units shall have a data synchronization feature. Operation data such as set points, time schedule, and alarm status shall be automatically synchronized among all the units under the same local area network.

4.7 To avoid hunting among multiple units, the units shall have a control value averaging algorithm which allows units to exchange sensor readings and control the room based on the common desired average values. Units shall be capable of displaying the network temperature and humidity or the individual unit's temperature and humidity.

CLIMATEWORX
MISSION CRITICAL CLIMATE CONTROL

FOR ALL SPECIAL REQUIREMENTS, PLEASE CONTACT US

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