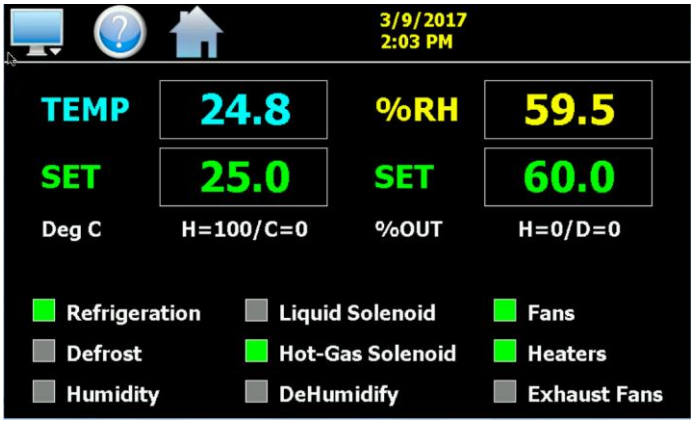
Control Panel with **CCS-4000** Touchscreen Controller

For the ES2000 Standard Product Line



CCS-4000 Touchscreen Controller Features

The CCS-4000 touchscreen controller system was developed with Environmental Chambers in mind. Providing the ultimate in modern technology, the system provides intuitive control screens and menus, easily programmed process alarms, and highly configurable circuit switching. Specific features include:

- **Control module design** which is dedicated microprocessor based I/O hardware with programmed logic running on Windows CE® platform. The control logic program is stored on a non-volatile, high capacity memory card. All control parameter settings, alarms and setpoints are maintained during power failure, and restart is automatic upon power restoration.
- **Backlit, alphanumeric 1 GHz TFD LCD** 256 color (800 x 600 pixels) touchscreen Operator access to all system parameters through intuitive, Windows® style drop down menus or modern icon based “smart device” finger navigation. The 7" display is compatible with various room lighting conditions. Menu selections and on-screen instructions with on screen help are of sufficient detail to allow for typical day-to-day use without reference manuals.
- **Conformance to the FDA 21 CFR 11 requirements** for data recording, audit trails of controller settings modification, alarm history logs, operator event logs and secure file transfers. Operating data is encrypted and stored in user defined time length log files, and can be viewed on the touchscreen, or remotely by PC. Password protection provides multiple levels of user access and defined rights. Password aging and re-authentication for process changes are also provided per 21 CFR 11.
- **Real-time trending charts** (8) and standard recording of temperature and humidity parameters and setpoints. The touchscreen provides autoscaled and user definable scaled plots over a 4 minute to 24 hour time period. A 'drag and zoom' feature allows for magnified views within a specific plot period.
- **Interface USB port** for data transfer to removable memory stick The removable memory stick allows export and import of profiles, alarm files, audit trail files, and other data files.
- **Independent, adjustable high and low deviation alarm set points** for temperature and humidity. These alarms allow a closer setting to chamber parameters and provide user notification that an alarm condition exists. Users are notified via front screen flashing alarm icon, audible and remote contacts.
- **Independent time delay action** for each alarm parameter. Alarm action delays and audible alarm delays are each adjustable from 0 to 60 minutes in 1 minute increments. Single pole, double throw (SPDT) 'common alarm' contacts activate after alarm action delay
- **Independent, adjustable high and low limit alarm set points** for temperature and humidity. Automatic alarms disable specific controlled devices (heaters, blowers, steam generators, etc), and trigger backup mechanical conditioning system operation **(with redundancy option)**. Operators are notified of alarms through a front screen flashing alarm icon, the activation of an audible alarm, the switching of a remote alarm contact set, and the creation of an alarm log with time, date, and type of alarm.
- "**Intelligent" adaptive defrost timer**; time or temperature initiated and time or temperature terminated. By sensing chamber coil temperature, the timer allows for minimum temperature rise due to a defrost cycle. The adjustable fan time delay, or an evaporator coil temperature sensor, terminates the defrost cycle and pre-cools the evaporator coil to an operator selected temperature before re-energizing the fans. Defrost is automatically disabled through either a set coil temperature above freezing, or by exceeding a maximum temperature rise setpoint. This function is specific to individual applications.
- A **“Low Rise” defrost option is available** that drastically reduces defrost rise for special freezer applications.
- **"Intelligent" enabling / disabling of humidification and dehumidification.** Humidification is disabled below freezing, and dehumidification is disabled at factory-selected conditions where drying is not required.
- **Solid state, "zero switching" outputs**, for refrigeration and humidity control. Zero switching outputs prevent unnecessary radio frequency interference. Standard solenoid or solid state relay cycling is provided on an adjustable time base of 4 to 32 seconds.

- **The control system features communication capabilities** for an Ethernet/Lan connection, which provides an extensive list of features including email, SMS (text messaging) on alarm, FTP (file transfer protocol for auto file transfer/data backup), remote access (web and VNS embedded servers), and national time server time synchronization.
- **The chamber control system can be remotely monitored** and/or controlled via PC, smart phone or tablet using a LAN/VNC application when connected to the internet or an internal network**.** An optional wireless connection can be provided using a wireless modem.
- **The Ethernet connection** also provides a simpler option: remote viewing of chamber process variables and alarms through a web browser. This web screen includes: process setpoints, process actual, and system alarms with name and date/time of alarms. This viewing option is "read only", with no communication back to the control system. A RS-485 Modbus RTU communication option is available upon request.
- **Remote monitoring capability** provided via 4-20 mA DC scaled outputs.
- **Service-friendly user interface design**. User screens were designed with consideration to maintenance/service. The screens provide useful service information such as cooling output, heating output, valve status, etc. The screens may also provide indication of parameters per the *multi-point monitoring capability* option detailed below.
- **Proportional control valve outputs.** Control is typically provided by time based proportioning of rapid cycle valves, but is also available by 4-20 mA DC, and supports refrigeration valves or chilled water control valves. **Note: Proportional output only applicable to proportional refrigeration valve purchase.*