SECTION 26 0938

ARCHITECTURAL LIGHTING CONTROLS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Architectural controls: Echo.

B. DMX distribution: DMX Splitter.

1.2 RELATED SECTIONS

A. Section 26 5561 – Theatrical Lighting and Rigging Systems

1.3 SUBMITTALS

A. Product data:

1. Manufacturer's data sheets on each product to be used.
2. Preparation instructions and recommendations.
3. Storage and handling requirements and recommendations.
4. Typical installation methods.

B. Verification samples: Two representative units of each type, size, pattern, and color.

C. Shop drawings: Include details of materials, construction, and finish. Include relationship with adjacent construction.

1.4 QUALITY ASSURANCE

A. Manufacturer qualifications: Company specializing in manufacturing products specified in this section with a minimum five years documented experience.

B. Installer qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.

C. Source limitations: Provide each type of product from a single manufacturing source to ensure uniformity.

1.5 PRE-INSTALLATION CONFERENCE

A. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Engineer, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store and handle in strict compliance with manufacturer's written instructions and recommendations.

B. Protect from damage due to weather, excessive temperature, and construction operations.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.8 WARRANTY

A. Manufacturer's standard limited warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. ETC, Inc., which is located at: 3031 Pleasant View Rd., P. O. Box 620979; Middleton, WI 53562-0979

B. Pathway Connectivity, an Acuity Brands Company, located at One Lithonia Way, Conyers, GA 30012

2.2 ARCHITECTURAL CONTROLS - ECHO

A. Interfaces:

1. Product: Unison Echo DMX Scene Controller.

a. Model: EDMXC Echo DMX Scene Controller.
b. DMX input for snapshot capture of lighting scenes.
c. 32 presets of 512 DMX addresses.
d. Sequence playback of presets.
e. Echo control of 16 patched DMX Zones.
f. Works with EchoAccess and Inspire Four-Button with Fader Station for live control of intensity, hue and saturation or color temperature of Echo zones.
g. Basic and custom-use modes.
h. Configurable Power On Behavior, DMX Loss Action, and DMX Active Action.
i. Demand Response integration.

2. Standards compliance: UL and cUL Listed. CE Compliant.
3. Functional: Unison Echo DMX Scene Controller.

a. Direct control or Recall prerecorded scenes for playback using DMX.
b. DMX input for snapshot recording up to 32 presets.
c. DMX output for up to 512 addresses.
d. Sequence playback of presets.
e. Use any Unison Echo station for preset or sequence playback.
f. Supports DMX pass-through for real-time output of incoming level when recording snapshots.
g. Meets USITT DMX-512A specifications.
h. EchoAccess configurable Power On Behavior, DMX Loss Action, and DMX Active Action.
i. Demand Response integration options.

4. Mechanical:

a. Din-rail mounting complies with DIN43880 (35/7.5 rail).
b. One integrated DMX-input and one integrated DMX-output port.

c. Toggle switches for DMX-Termination and Config Mode.
d. DMX-In, DMX-Out and power indicators.

1) Blue power indicator.
2) Bi-color DMX activity indicator.

5. Electrical:

a. MicroSD card slot for firmware maintenance.
b. Connects to two-wire EchoConnect control networks through low-voltage Class 2 wiring.

1) Topology-Free Wiring: Belden 8471 and No. 14 ESD drain wire.
2) Two No. 16 AWG wires for 24 VDC auxiliary power when required.

c. Supports 24 VDC.

6. Operational room temperature: 32 to 122 degrees F (0 to 50 degrees C).
7. Relative humidity non-condensing: 5 to 95 percent.
8. DMX ports:

a. Eight-position removable pluggable connectors for in and out ports.

1) Connectors designed for use with Belden 9729.
2) Optional headers available for use with Belden 1583A.

b. Input is fully optically isolated from controller electronics.
c. Withstands fault voltages up to 250 VAC.
d. Integrated DMX termination.

9. EchoAccess Configuration Option:

a. DMX Output Refresh Rate.
b. Preset Timings.
c. Definable Power On, DMX Loss, and DMX Active behavior.

B. Power modules:

1. Product: Unison EchoConnect Station Power Supply by ETC Inc.

a. Model E-SPS-DIN: DIN Rail Mount Station Power Supply with 24 V Aux.

2. Convert Input Power into Class II Low-Voltage Power with data line. Energize control stations, zone controllers, time clock, and devices for multi-scene lighting control.
3. Electrical:

a. Utilize line-voltage power, terminated inside dimming enclosure, or power supply.
b. EchoConnect Communications with Remote Devices: Control stations, zone controllers, time clock stations and other devices.
c. EchoConnect Network: Low-voltage Class II twisted pair wiring, type Belden 8471 (unshielded) or Belden 8719 (shielded). And one No 14 AWG drain wire for system not using grounded metal conduit.

1) Topology Free Network: Bus, loop, home run, star, or any combination.
2) Control Bus Wiring: Permit total wire runs of 1640 ft (500 m)

3) Wiring Between Stations: Not to exceed 1313 ft (400 m).
4) CAT5 Wiring: For systems not requiring topology free infrastructure or EchoConnect bus lengths not more than 1000 ft (305 m).

4. Capacity: Power for up to 16 control stations, zone controllers, time clock stations and other devices, and/or provide 24 V Auxiliary Power to devices that require it.

C. Touchscreen control stations to be Unison Echo EchoTouch Controller Mk2 by ETC, Inc. Controls 512 DMX addresses on up to 80 control zones.

1. Standards compliance: cULus Listed and CE Compliant. FCC Compliant.
2. Operation: Graphic buttons, faders, and images on at least 7 user programmable default and fully graphical control pages.
3. Touchscreen: Integrated with ETC Unison Echo Controls.

a. Seven-inch, backlit liquid crystal display. Resolution: 800 by 400 pixels minimum, with capacitive multi-touch interface.
b. Bezels: Cast aluminum. Finish: Fine texture powder coat.

1) Four colors: Cream, Gray, Black, or Signal White.
2) No visible means of attachment.

c. Supports surface, flush and rack mounting.

1) Flush-mount: To industry standard 3 gang back box.
2) Surface back box dimensions (WxHxD): 7.35 x 4.88 x 3.5 inches available from manufacturer.
3) Rack mounting: Fit in standard 19 inch racks, no taller than 3 EIA rack units.

4. Electrical:

a. RJ45 ethernet port: Connection to lighting system and Power over Ethernet.
b. Control wiring: EchoConnect Connection terminals.

1) Low-voltage, Class II unshielded twisted pair, type Belden 8471 and one No. 14 ESD drain wire; when not installed in grounded metal conduit.
2) Topology free. Point-to-point, bus, loop, home run or any combination.

c. Power input, Non-PoE: Two, No. 16 AWG stranded wires for 24 VDC.
d. Typical power draw: 400 mA.
e. Firmware maintenance: USB type A connector.
f. Network:

1) Network cabling: Category 5 or better. Conform to TIA-568A/B. Installed by qualified network installers.

g. Functional system:

1) Presets: 64. Contained in non-volatile electronic memory.
2) Internal sequences: 4. Record user-selected zone levels.
3) Touchscreen: Equipped with on-board help system.
4) Software upgrades: Via USB drive only.
5) USB Port: Show data to be saved for archival or transfer to other consoles or a personal computer.

h. Patching: Facilities for dimmers and multi-parameter devices via built in library of fixture definitions.

1) Fixture library: Updated via software based updates. Create custom fixture definitions using offline application.
2) Touchscreen: Support patching, address setting, and mode changes using Remote Device Management (RDM) on local DMX/RDM port.

i. Playback control: Customizable zone display. Rearrange graphical representations for control channels to mimic fixture positions in installation.

1) Seven user customizable interactive pages.
2) Color and white pickers.
3) Touch-based parameter controls with reference-based palettes.
4) Virtual level wheel.

j. Layout and configuration: View and modify layout of user pages.

1) Add, remove, or edit the following items: Preset buttons. Off buttons. Sequence buttons. Zone and space modifier buttons. Space combine buttons. Zone fader.
2) Three Options for Inactivity: Dim screen to level. Turn screen off. Display user chosen inactivity image.
3) Multiple Configurations: May be stored within an LCD Station.

5. Time clock: Touchscreen built-in astronomical and real time event engine allowing presets and sequences activation.

a. Support 80 events: Astronomical, real-time, and manual control events in 16 control spaces.
b. Timed events: Programmable via Touchscreen.

1) Assigned to day types.

a) Day Types: everyday, weekday, weekend, and day of week.

2) Activation: Based on sunrise, sunset, time of day, opened and closed events and configurable state based engine.
3) Compensate for regions using daylight saving time.
4) Assignment to events via time clock user interface.
5) Resumes automatically after power loss.

2.3 DMX DISTRIBUTION - PATHWAY

A. DMX/RDM splitter.

B. General:

1. Basis of design: DMX512 Repeater DIN-mount 4 DMX512 Ports.
2. Repeat optically isolated DMX512 and RDM signal.
3. RDM variants:

a. Non-RDM.
b. RDM capable.

C. Mechanical:

1. Housing: UL94 5VA extruded rigid polyvinyl chloride.
2. Mounting: Toolless TS35 DIN rail.
3. Ports:

    a. Six 5-pin male headers for DMX512.
    b. One 5-pin male header for power in.

4. Detachable accessories:

    a. Six 5-pin male headers to wire stop IDC terminal block.
    b. Seven 5-pin male headers to screw flange terminal blocks.

5. Non-RDM variant: One single pole slide switch for DMX512 termination.

D. Electrical:

1. Power in:

    a. Minimum: 9 volts DC
    b. Maximum: 36 volts DC.
    c. Milliamps: 667.

2. Topology: Star.
3. DMX512 port protection:

    a. Fault and overcurrent: 250 volts AC thermal switch.
    b. Port to port optical isolation: 3000 volts AC.
    c. DMX512 input to output in-line optical isolation.
    d. DMX512 input to thru repeated electrically.

4. Single-color integral LED status indicators:

    a. One Power.
    b. One DMX512 input.
    c. Non-RDM variant:

        1) Four DMX512 output.
        2) One 5-volt isolation.

    d. RDM capable variant:

        1) One processor.
        2) One DMX/RDM.
        3) Four RDM.
        4) Four power isolation.

E. Functional:

1. Standalone and independent operation.
2. Isolated repeated DMX512 communication.
3. RDM capable variant:

    a. Respond to RDM signal.
    b. Send RDM signal.

4. DMX512 port communication:

    a. Non-RDM variant: Simplex DMX512.
    b. RDM capable variant: Half-duplex DMX/RDM.

5. Single-color integral LED status indicators:

    a. Blue power

        1) On: Receiving power.
        2) Off: Not receiving power.

    b. Green processor

        1) On: Normal.
        2) Off: Not receiving power.

    c. Blue power and green processor off: Processor failure.
    d. Amber DMX512 input

        1) On: Receiving DMX512 signal.
        2) Off: Not receiving DMX512 signal.

    e. Green DMX512 output

        1) On: Transmitting DMX512 signal.
        2) Off: Not transmitting DMX512 signal.

    f. Red isolated power out

        1) On: Power out.
        2) Off: No power out.

    g. Amber RDM

        1) Flashing: Receiving RDM signal.
        2) Off: Not receiving RDM signal.

6. Non RDM variant switch:

    a. On: 120 ohms resistance on DMX512 thru.
    b. Off: No resistance on DMX512 thru.

7. RDM capable variant processor

    a. Memory: Non-volatile flash.
    b. Firmware updates upload: Via latched DMX512 input signal.
    c. Architecture: 8-bit RISC.
    d. Speed: 16 Megahertz.
    e. Memory:

        1) 8 kilobyte flash.
        2) 512 Bytes EEPROM.
        3) 1 kilobyte internal SRAM.

8. RS485 transceiver:

    a. Electrical data isolation.
    b. 500 kilobits per second data rate.

F. Environmental:

1. Operating temperature:

    a. Minimum: 14 degrees Fahrenheit
    b. Maximum: 113 degrees Fahrenheit

2. Operating non-condensing humidity:

    a. Minimum: 5 percent
    b. Maximum: 95 percent

3. Cooling method: Passive convection.

G. Interfaces:

1. Product: Unison Echo DMX Scene Controller.

    a. Model: EDMXC Echo DMX Scene Controller.
    b. DMX input for snapshot capture of lighting scenes.
    c. 32 presets of 512 DMX addresses.
    d. Sequence playback of presets.
    e. Echo control of 16 patched DMX Zones.
    f. Works with EchoAccess and Inspire Four-Button with Fader Station for live control of intensity, hue and saturation or color temperature of Echo zones.
    g. Basic and custom-use modes.
    h. Configurable Power On Behavior, DMX Loss Action, and DMX Active Action.
    i. Demand Response integration.

2. Standards compliance: UL and cUL Listed. CE Compliant.
3. Functional: Unison Echo DMX Scene Controller.

    a. Direct control or Recall prerecorded scenes for playback using DMX.
    b. DMX input for snapshot recording up to 32 presets.
    c. DMX output for up to 512 addresses.
    d. Sequence playback of presets.
    e. Use any Unison Echo station for preset or sequence playback.

4. Supports DMX pass-through for real-time output of incoming level when recording snapshots

PART 3 - EXECUTION

3.1 GENERAL

A. Receive and store the necessary materials and equipment for installation of the dimmer system. Include required for proper and complete installation and operation of the dimming system, even though every item may not be specifically mentioned. Deliver on a timely basis to other trades any equipment that must be installed during construction.

3.2 EXAMINATION

A. Do not begin installation until substrates have been properly constructed and prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.

3.3 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.4 INSTALLATION

A. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.

3.5 FIELD QUALITY CONTROL

A. Field inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

B. Manufacturer's services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.

3.6 CLEANING AND PROTECTION

A. Clean products in accordance with the manufacturer recommendations.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION