SECTION 26 09 61

ENTERTAINMENT LIGHTING CONTROLS

Display hidden notes to specifier. (Don't know how? [Click Here](https://www.arcat.com/sd/display_hidden_notes.shtml))

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\*\* NOTE TO SPECIFIER \*\* ETC Inc.; lighting and rigging products.  
This section is based on the products of ETC Inc., which is located at:  
  
3031 Pleasant View Rd. P. O. Box 620979  
Middleton, WI 53562-0979  
Phone: 608-831-4116  
Email: [mail@etcconnect.com](mailto:mail@etcconnect.com)  
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[ [Click Here](https://www.arcat.com/company/etc-inc-43555) ] for additional information.  
Christmas Eve 2020 marked ETC's 45th anniversary, and there's no denying we've come a long way. Now a global leader in the manufacturing of lighting and rigging technology, ETC employs over 1,200 people in 16 corporate offices around the world. ETC is proud of its industry reputation for unmatched technical and customer service, 24/7/365. And with a family of over 300 authorized service centers throughout the world, staffed by hundreds of certified technicians, customers are never far from an ETC resource with a face and a name.  
We develop professional tools and make them accessible to everyone. Our products can be found in small and large venues worldwide, such as theatres, churches, restaurants, hotels, schools, television studios, casinos, theme parks, and opera houses.

1. GENERAL
   1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Entertainment controls.
       1. ColorSource.
       2. Eos.
       3. Multiverse.
       4. Networking.
       5. Response.
    2. Software. (Eos)
  1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 26 27 16 - Electrical Cabinets and Enclosures.
    2. Section 26 09 23 - Architectural Lighting Controls
    3. Section 26 09 43 - Network Lighting Controls.
    4. Section 41 67 19 - Plant Safety Equipment. Building integrator shall provide integration of the lighting control system with Building Automation Systems.
  1. SUBMITTALS
     1. Submit under provisions of Section 01 30 00 Administrative Requirements.
     2. 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.

\*\* NOTE TO SPECIFIER \*\* Delete if not applicable to product type.

* + 1. Verification Samples: Two representative units of each type, size, pattern, and color.
    2. Shop Drawings: Include details of materials, construction, and finish. Include relationship with adjacent construction.
  1. QUALITY ASSURANCE
     1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum five years documented experience.
     2. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.
     3. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.
  2. PRE-INSTALLATION CONFERENCE
     1. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.
  3. DELIVERY, STORAGE, AND HANDLING
     1. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
     2. Protect from damage due to weather, excessive temperature, and construction operations.
  4. PROJECT CONDITIONS
     1. 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.
  5. WARRANTY
     1. Manufacturer's standard limited warranty unless indicated otherwise.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: ETC Inc, which is located at: 3031 Pleasant View Rd., P. O. Box 620979; Middleton, WI 53562-0979; Phone: 608-831-4116; Email: [mail@etcconnect.com](mailto:mail@etcconnect.com); Web: [www.etcconnect.com](https://www.etcconnect.com).

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
    2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 Product Requirements.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. ENTERTAINMENT CONTROLS (COLORSOURCE)

\*\* NOTE TO SPECIFIER \*\* Hands-on control designed for the latest technology, specializing in streamlined, plug-and-play setup. The console recognizes intelligent lights in the rig via RDM and auto-populates them in patch, and the on-board touchscreen allows fixtures to be dragged into place on a customizable stage map for quick selection and programming. The faders and touchscreen can be used to control moving lights, mix LED colors, play stored looks and effects and with the AV consoles -play sound and visual media.

* + 1. Product: ColorSource Consoles as manufactured by ETC Inc.

\*\* NOTE TO SPECIFIER \*\* Delete model options not required.

* + - 1. Model CS20: 20 Fader ColorSource console; 80 Channels or Devices.
         1. 80 channels / multi-parameter devices.
         2. 20 Channel / Playback faders with color indication.
         3. DMX/RDM Port: One.
         4. USB Port: One.
         5. Onboard Storage for Show Files: 2 GB.
      2. Model CS40: 40 Fader ColorSource console; 80 Channels or Devices.
         1. 80 channels / multi-parameter devices.
         2. 40 Channel / Playback faders with color indication.
         3. DMX/RDM Port: One.
         4. USB Port: One.
         5. Onboard Storage for Show Files: 2 GB.
      3. Model CS20AV 20 Fader ColorSource AV console with network, audio, and video features; 80 Channels/Devices.
         1. 80 channels / multi-parameter devices.
         2. 20 Channel / Playback faders with color indication.
         3. DMX/RDM Port: Two.
         4. USB Port: Two.
         5. RJ45 for network; sACN, ArtNet, and OSC.
         6. Sound-to-light playback.
         7. HDMI port for monitor or media playback.
         8. "Amigo" browser-based remote.
         9. Onboard Storage for Show Files and Media: 25 GB.
      4. Model CS40AV 40 ColorSource AV console with network, audio, and video features (80 Channels or Devices)
         1. 80 channels / multi-parameter devices.
         2. 40 Channel / Playback faders with color indication.
         3. DMX/RDM Port: Two.
         4. USB Port: Two.
         5. RJ45 for network; sACN, ArtNet, and OSC.
         6. Sound-to-light playback.
         7. HDMI port for monitor or media playback.
         8. "Amigo" browser-based remote.
         9. Onboard Storage for Show Files and Media: 25 GB.
      5. Mechanical:
         1. One home and five configurable softkey buttons.
         2. Four configurable function faders.
         3. Color Multi-Touch Touchscreen: 7 inch.
      6. Playback Controls:
         1. One cue list with 999 cues.
         2. 10 pages of 20 or 40 playbacks.

Static memories or sequences.

* + - * 1. Playback Toy for filtered and timed execution of playbacks.
        2. Multiple bump modes; Flash, Solo, Solo Change, Move/Go.
        3. Full-history rubber banding for playbacks.
        4. On-board help system.
        5. Extensive library for controlling moving lights.

\*\* NOTE TO SPECIFIER \*\* The Media paragraph below pertains to CS20AV and CS40AV models only. .Delete if not required.

* + - 1. Media:
         1. Audio Input Type:

1/8 inch (3.5 mm) TRS, Stereo, unbalanced.

Line in: -10 dBV (316 mV RMS).

Input Impedance: 29k ohms.

* + - * 1. Audio Output Type:

1/8 inch (3.5 mm) TRS, Stereo, unbalanced.

Line Out: -10 dBV (316 mV RMS) at 10k ohms "Line Level".

Load Impedance: 10k to 200k ohms.

* + - * 1. Supported Media File Formats: Visual output is limited to still images and effects from the VideoToy feature of the ColorSource AV console. Movie files are not supported.

Audio: mp3, aac and wav files. 44.1 kHz sample rate, 4 GB max file.

Image: jpg, png, tiff, and bmp files. 1280 x 720 max resolution.

* + - 1. Regulatory and Compliance: cETLus Listed. CE Compliant.
      2. Programming Tools:
         1. Color and white pickers.
         2. Reference based Position, Color and Beam palettes.
         3. Innovative touch-based parameter controls.
         4. Auto fixture selection on fader moves.
         5. Virtual Level/Rate wheel.
         6. Customizable Channel display using Stage Map.
         7. Effects: Intensity, color, shape, and parameter.
         8. Fixture Tags for Quick Selects.
         9. 27 Quick Select groupings.
         10. Two independent channels.
         11. Virtual keypad for level entry.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required or delete products not required.

* 1. ENTERTAINMENT CONTROLS (EOS)

\*\* NOTE TO SPECIFIER \*\* Generous programming surfaces and power to run complex lighting and media rigs. The largest of ETC's lighting control line. A hands-on, professional workspace powered by Eos control software. Features include customizable Target keys for Direct Selects, a built-in soft keypad, book lights for paperwork, drawers for accessories, dual-axis folding displays, and generous encoder tools for LEDs, moving lights, and media control. Offers more playbacks than other Eos Family consoles. Tactile rig control for the largest venues and productions.

* + 1. Product: Eos Apex 20 as manufactured by ETC Inc.
       1. Model EOS APEX 20: Eos Apex 20, 24,576 output.
       2. Power Consumption: Approximately 6A at 120 V or 230/240 V.
       3. Ambient Room Temperature: 32 to 95 degrees F (0 to 35 degrees C).
       4. Ambient Humidity: Up to 90 percent non-condensing.
       5. Regulatory Compliance: CE compliant, cETLus listed, UKCA marked, FCC compliant, RoHS compliant, and WEEE.
       6. Hardware and Interfaces:
          1. Two 27-inch 4K multi-touch LCD touchscreens, in an articulating dual-axis display panel.
          2. Supports three external display port monitors (1920x1080 minimum, 3840x2160 maximum), with optional single-touch or multi-touch screen control and DDC/CI support.
          3. 20 60 mm motorized faders, 100 10-fader pages for configurable faders, for channel, submaster and palette/preset, timing and effect rate/speed playback control.
          4. Twenty backlit scroll wheel faders with button, 100 10-fader pages for configurable faders, for channel, submaster and palette/preset, timing and effect rate/speed playback control.
          5. Four 5-inch high-resolution fader displays, with multi-touch and haptic touch feedback.
          6. Main Playback with two 60 mm motorized faders, and display load buttons.
          7. Five banks of 10-button user-definable Target Keys.
          8. Six force-feedback encoders for non-intensity parameter control.
          9. Eight backlit mini encoders for non-intensity parameter control, plus one mini encoder for navigation.
          10. Dedicated 10.1-inch high-resolution encoder display.
          11. Dedicated high-resolution intensity level wheel.
          12. Backlit expanded Eos keypad.
          13. 6.3-inch keypad touchscreen, with haptic touch feedback, servicing softkeys and custom user layouts.
          14. Built-in keyboard tray, with USB A & C ports.
          15. Built-in accessory tray, with USB A & C ports and dedicated 5-volt/2-amp USB-A charging port.
          16. One front-facing 5-volt/2-amp USB-A dedicated charging port.
          17. Two independently dimmable warm-white LED booklights to illuminate adjacent surfaces.
          18. Solid-state hard drive.
          19. Dedicated graphics processing.
          20. IEC power input (100- 240 VAC at 50/60 Hz), inset power switch with integrated breaker, locking regionalized power cable included.
          21. Four individually configurable Gigabit Ethernet ports, etherCON connectors, PoE++ (802.3bt compliant PSE).
          22. Two individually configurable 10-Gigabit SFP+ ports, which accept modules for copper, single-mode fiber, or multi-mode fiber connections.
          23. One 802.11ac WiFi Ethernet adapter (to be enabled with future software).
          24. Bluetooth 5.1 for connecting input accessories (to be enabled with future software).
          25. sACN and Art-Net network output protocols.
          26. USB 3.1 ports, for flash drives, pointing devices, keyboards (12 USB-A ports, 8 USB-C ports).
          27. Two Littlite XLR ports.
          28. Two Kensington lock ports.
          29. I/O Garage with four bays, which accept Response backpack style show control gateways, or Gadget II DMX output modules.
          30. Multiple MIDI and/or SMPTE timecode inputs, MIDI In and Out, Analog/Serial Inputs, OSC transmit/receive, UDP transmit/receive through network interface or Response Gateways.

\*\* NOTE TO SPECIFIER \*\* Generous programming surfaces and power to run complex lighting and media rigs. The mid-sized console in the Apex class of lighting controllers. Hands-on, professional workspace powered by Eos control software. Features include customizable Target keys for Direct Selects, built-in soft keypad, book lights for paperwork, drawers for accessories, dual-axis folding displays, and generous encoder tools for LEDs, moving lights, and media control. Delete if not required.

* + 1. Product: Eos Apex 10 as manufactured by ETC Inc.
       1. Model EOS APEX 10: Eos Apex 10, 24,576 outputs.
       2. Power consumption: Approximately 6 A at 120 V or 230/240 V.
       3. Ambient Room Temperature: 32 to 95 degrees F (0 to 35 degrees C).
       4. Ambient Humidity: Up to 90 percent non-condensing.
       5. Regulatory Compliance: CE compliant. cETLus listed. UKCA marked. FCC compliant. RoHS compliant. WEEE.
       6. Hardware and Interfaces:
          1. Two 23.8 inch 4K multi-touch LCD touchscreens, in an articulating dual-axis display panel.
          2. Supports three external display port monitors (1920 x 1080 min to 3840 x 2160 maximum), with optional single-touch or multi-touch screen control and DDC/CI support.
          3. Ten 60 mm motorized faders, a hundred 10-fader pages for configurable faders, for channel, submaster and palette/preset, timing and effect rate/speed playback control.
          4. Ten backlit scroll wheel faders with button, a hundred 10-fader pages for configurable faders, for channel, submaster and palette/preset, timing and effect rate/speed playback control.
          5. Two 5-inch high-resolution fader displays, with multi-touch and haptic touch feedback
          6. Main Playback with two 60 mm motorized faders, and display load buttons.
          7. Four banks of 10-button user-definable Target Keys
          8. Six force-feedback encoders for non-intensity parameter control
          9. Eight backlit mini encoders for non-intensity parameter control,
          10. plus one mini encoder for navigation
          11. Dedicated 10.1-inch high-resolution encoder display.
          12. Dedicated high-resolution intensity level wheel.
          13. Backlit expanded Eos keypad.
          14. 6.3-inch keypad touchscreen, with haptic touch feedback, servicing softkeys and custom user layouts.
          15. Built-in keyboard tray, with USB A and C ports.
          16. Built-in accessory tray, with USB A and C ports and dedicated 5-volt/2-amp USB-A charging port.
          17. One front-facing 5-volt/2-amp USB-A dedicated charging port
          18. Two independently dimmable warm-white LED booklights to illuminate adjacent surfaces.
          19. Solid-state hard drive.
          20. Dedicated graphics processing.
          21. IEC power input (100- 240 VAC at 50/60 Hz), inset power switch with integrated breaker, locking regionalized power cable included.
          22. Four individually configurable Gigabit Ethernet ports, etherCON connectors, PoE++ (802.3bt compliant PSE).
          23. Two individually configurable 10-Gigabit SFP+ ports, which accept modules for copper, single-mode fiber, or multi-mode fiber connections.
          24. One 802.11ac WiFi Ethernet adapter (to be enabled with future software).
          25. Bluetooth 5.1 for connecting input accessories (to be enabled with future software).
          26. sACN and Art-Net network output protocols.
          27. USB 3.1 ports, for flash drives, pointing devices, keyboards (12 USB-A ports, 8 USB-C ports).
          28. Two Littlite XLR ports.
          29. Two Kensington lock ports.
          30. I/O Garage with four bays, which accept Response backpack style show control gateways, or Gadget II DMX output modules.
          31. Multiple MIDI and/or SMPTE timecode inputs, MIDI In and Out, Analog/Serial Inputs, OSC transmit/receive, UDP transmit/receive through network interface or Response Gateways.

\*\* NOTE TO SPECIFIER \*\* The compact powerhouse of ETC's lighting controllers. Condensed programming surface provides access to the same tools as larger Apex desks. Powered by Eos control software, Features include customizable Target keys for Direct Selects, a built-in soft keypad, book lights for paperwork, a dual-axis folding display panel, and generous encoder tools for LEDs, moving lights, and media control. A smaller footprint without sacrificing programming power.

* + 1. Product: Eos Apex 5 as manufactured by ETC Inc.
       1. Model EOS APEX 5: Eos Apex 5, 24,576 outputs.
       2. Power consumption: Approximately 5 A at 120 V or 230/240 V.
       3. Ambient Room Temperature: 32 to 95 degrees F (0 to 35 degrees C).
       4. Ambient Humidity: Up to 90 percent non-condensing.
       5. Regulatory Compliance: CE compliant, cETLus listed, UKCA marked, FCC compliant, RoHS compliant, and WEEE.
       6. Hardware and Interfaces:
       7. One 23.8-inch 4K multi-touch LCD touchscreen, in an articulating dual-axis display panel.
       8. Supports three external display port monitors (1920x1080 minimum, 3840x2160 maximum), with optional single-touch or multi-touch screen control and DDC/CI support.
       9. Five 60mm motorized faders, 100 10-fader pages for configurable faders, for channel, submaster and palette/preset, timing and effect rate/speed playback control.
       10. Five backlit scroll wheel faders with button, 100 10-fader pages for configurable faders, for channel, submaster and palette/ preset, timing and effect rate/speed playback control.
       11. One 5-inch high-resolution fader display, with multi-touch and haptic touch feedback.
       12. Main Playback with two 60 mm motorized faders, and display load buttons.
       13. Two banks of 10-button user-definable Target Keys.
       14. Six force-feedback encoders for non-intensity parameter control.
       15. Eight backlit mini encoders for non-intensity parameter control, plus one mini encoder for navigation.
       16. Dedicated 10.1-inch high-resolution encoder display.
       17. Dedicated high-resolution intensity level wheel.
       18. Backlit expanded Eos keypad.
       19. 6.3-inch keypad touchscreen, with haptic touch feedback, servicing softkeys and custom user layouts.
       20. Built-in keyboard tray, with USB A and C ports.
       21. Two front-facing 5-volt/2-amp USB-A dedicated charging ports.
       22. Two independently dimmable warm-white LED booklights to illuminate adjacent surfaces.
       23. Solid-state hard drive.
       24. Dedicated graphics processing.
       25. IEC power input (100- 240 VAC at 50/60 Hz), inset power switch with integrated breaker, locking regionalized power cable included.
       26. Four individually configurable Gigabit Ethernet ports, etherCON connectors, PoE++ (802.3bt compliant PSE).
       27. Two individually configurable 10-Gigabit SFP+ ports, which accept modules for copper, single-mode fiber, or multi-mode fiber connections.
       28. One 802.11ac WiFi Ethernet adapter (to be enabled with future software).
       29. Bluetooth 5.1 for connecting input accessories (to be enabled with future software).
       30. sACN and Art-Net network output protocols.
       31. USB 3.1 ports, for flash drives, pointing devices, keyboards (8 USB-A ports, 6 USB-C ports).
       32. One Littlite XLR port.
       33. One Kensington lock port.
       34. I/O Garage with four bays, which accept Response backpack style show control gateways, or Gadget II DMX output modules.
       35. Multiple MIDI and/or SMPTE timecode inputs, MIDI In and Out, Analog/Serial Inputs, OSC transmit/receive, UDP transmit/receive through network interface or Response Gateways.

\*\* NOTE TO SPECIFIER \*\* Same power as Apex consoles, in a 2U 19-inch rack mount unit. Includes same one and ten-gigabit Ethernet connections as Apex consoles. Drive a high-powered rig on its own or serve as a backup to keep large systems running safely. Monitor and interact with your system using the built-in haptic touchscreen. Make Processor into a workstation by adding USB-connectable devices including touchscreens, Eos Fader Wings, and the Eos Programming Wing.

* + 1. Product: Eos Apex Processor as manufactured by ETC Inc.
       1. Model EOS APEX PROC: Eos Apex Processor, 24,576 outputs.
       2. Power consumption: Approximately 5 A at 120 V or 230/240 V.
       3. Ambient Room Temperature: 32 to 95 degrees F (0 to 35 degrees C).
       4. Ambient Humidity: Up to 90 percent non-condensing.
       5. Regulatory Compliance: CE compliant, cETLus listed, UKCA marked, FCC compliant, RoHS compliant, and WEEE.
       6. Hardware and Interfaces:
          1. 2U 19 inch rack-mount form factor.
          2. One 5 inch high-resolution front panel display, with multi-touch and haptic touch feedback.
          3. Supports three external display port monitors (1920 x 1080 min to 3840 x 2160 maximum), with optional single-touch or multi-touch screen control and DDC/CI support.
          4. One dimmable warm-white LED accent light.
          5. Solid-state hard drive.
          6. Dedicated graphics processing.
          7. IEC Power Input: 100 to 240 VAC at 50/60 Hz; fused mains power switch, locking regionalized power cable included.
          8. Four individually configurable Gigabit Ethernet ports, etherCON connectors, PoE++ (802.3bt compliant PSE)
          9. Two individually configurable 10-Gigabit SFP+ ports, which accept modules for copper, single-mode fiber, or multi-mode fiber connections.
          10. sACN and Art-Net network output protocols.
          11. USB 3.1 ports, for flash drives, pointing devices, keyboards.

USB-A Ports: 4. USB-C Ports: 4.

* + - * 1. One Kensington lock port.
        2. Multiple MIDI and/or SMPTE timecode inputs, MIDI In and Out, Analog/Serial Inputs, OSC transmit/receive, UDP transmit/receive through network interface or Response Gateways.

\*\* NOTE TO SPECIFIER \*\* Brings high-end control of larger Eos Family consoles to smaller venues. An articulating, 18.5-inch, multi-touch LCD display, five definable and page-able motorized faders, built-in keyboard tray, and a main fader pair. Gio @5 is a step up for Ion Xe users who want expanded hands-on access to playbacks, color control, touchscreen Magic Sheets and more.

* + 1. Product: Gio @5 as manufactured by ETC Inc.

\*\* NOTE TO SPECIFIER \*\* Delete model options not required.

* + - 1. Model Gio @5 4K: Gio @5, 4,096 outputs, base.
      2. Model Gio @5 24K: Gio @5, 24,576 outputs, maximum.
      3. Power consumption: Approximately 2 A at 120 V or 230/240 V.
      4. Ambient Room Temperature: 32 to 95 degrees F (0 to 35 degrees C).
      5. Ambient Humidity: Up to 90 percent non-condensing
      6. Regulatory Compliance: CE compliant, cULus listed, UKCA marked, FCC compliant, RoHS compliant, and WEEE.
      7. Hardware and Interfaces:
         1. One 18.5 inch multi-touch LCD touchscreen for display, direct selection, and context-sensitive control.
         2. Supports two external display port monitors (1920x1080 minimum, 3840x2160 maximum), with optional single-touch or multi-touch screen control and DDC/CI support.
         3. Five 60 mm faders dedicated 4.3 inch color LCD display, 100 10-fader pages configurable as channels, submasters, palettes/presets, timing, and effect rate/speed playback control.
         4. Main Playback with two 60 mm motorized faders.
         5. Four force-feedback encoders for non-intensity parameter control.
         6. Dedicated high-resolution intensity level wheel.
         7. Backlit Eos keypad.
         8. Built-in keyboard tray.
         9. Dedicated macro buttons.
         10. Solid-state hard drive.
         11. IEC Power Input: 100 to 240 VAC at 50/60 Hz, fused mains power switch, locking regionalized power cable included.
         12. Two individually configurable Gigabit Ethernet ports, RJ45 connectors.
         13. One 802.11ac Wi-Fi Ethernet adapter. To be enabled with future software.
         14. Bluetooth 5.1 for connecting input accessories. To be enabled with future software.
         15. sACN and Art-Net network output protocols.
         16. Four DMX-512 / RDM 5-pin XLR ports.
         17. Contact closure triggers via D-Sub connector.
         18. USB 3.1 ports, for flash drives, pointing devices, keyboards.

USB-A Ports: 9. USB-C Ports: 2

* + - * 1. One Littlite XLR port.
        2. One Kensington lock port.
        3. Multiple MIDI and/or SMPTE timecode inputs, MIDI In and Out, Analog/Serial Inputs, OSC transmit/receive, UDP transmit/receive through network interface or Response Gateways.

\*\* NOTE TO SPECIFIER \*\* Compact console that includes programming and playback controls. Backlit keyboard and full-featured software of other Eos Family consoles, Twenty non-motorized faders and dedicated displays to easily run control manually.

* + 1. Product: Ion XE 20 as manufactured by ETC Inc.

\*\* NOTE TO SPECIFIER \*\* Delete model options not required.

* + - 1. Model Ion Xe 20 2K: Ion Xe 20 console, 2,048 outputs, base.
      2. Model Ion Xe 20 12K: Ion Xe 20 console, 12,288 outputs, maximum.
      3. Power consumption: Approximately 2 A at 120 V or 230/240 V.
      4. Ambient Room Temperature: 32 to 95 degrees F (0 to 35 degrees C).
      5. Ambient Humidity: Up to 90 percent non-condensing.
      6. Regulatory Compliance: CE compliant, cETLus listed, UKCA marked, FCC compliant, RoHS compliant, and WEEE.
      7. Hardware and Interfaces:
         1. Supports two external display port monitors (1920 x 1080 min, 3840 x 2160 max). Optional single-touch or multi-touch screen control and DDC/CI support.
         2. Twenty 45 mm standard faders, 100 10-fader pages configurable as channels, submasters, palettes/presets, timing, and effect rate/speed playback control.
         3. Two internal monochromatic LCD displays for fader content.
         4. Main Playback with two 100 mm standard faders.
         5. Four encoders for non-intensity parameter control.
         6. Dedicated high-resolution intensity level wheel.
         7. Backlit Eos keypad.
         8. Included USB keyboard.
         9. Solid-state hard drive.
         10. IEC Power Input: 100 to 240 VAC at 50/60 Hz, fused mains power switch, locking regionalized power cable included.
         11. Two individually configurable Gigabit Ethernet ports, RJ45 connectors.
         12. One 802.11ac Wi-Fi Ethernet adapter. To be enabled with future software.
         13. Bluetooth 5.1 for connecting input accessories. To be enabled with future software.
         14. sACN and Art-Net network output protocols.
         15. Four DMX-512 / RDM 5-pin XLR ports.
         16. Contact closure triggers via D-Sub connector.
         17. USB 3.1 ports, for flash drives, pointing devices, keyboards.

USB-A Ports: 5. USB-C Ports: 2.

* + - * 1. One Littlite XLR port.
        2. One Kensington lock port.
        3. Multiple MIDI and/or SMPTE timecode inputs, MIDI In and Out, Analog/Serial Inputs, OSC transmit/receive, UDP transmit/receive through network interface or Response Gateways.

\*\* NOTE TO SPECIFIER \*\* Compact workhorse of Eos Family. The same backlit keyboard layout and full-featured software as larger consoles in the family. The complete Eos experience in a budget-friendly and portable package.

* + 1. Product: Ion XE as manufactured by ETC Inc.

\*\* NOTE TO SPECIFIER \*\* Delete model options not required.

* + - 1. Model Ion Xe 2K: Ion Xe console, 2,048 outputs, base.
      2. Model Ion Xe 12K: Ion Xe console, 12,288 outputs, maximum.
      3. Power consumption: Approximately 2 A at 120 V or 230/240 V.
      4. Ambient Room Temperature: 32 to 95 degrees F (0 to 35 degrees C).
      5. Ambient Humidity: Up to 90 percent non-condensing.
      6. Regulatory Compliance: CE compliant, cETLus listed, UKCA marked, FCC compliant, RoHS compliant, and WEEE.
      7. Hardware and Interfaces:
         1. Supports two external display port monitors (1920 x 1080 min, 3840 x 2160 max). Optional single-touch or multi-touch screen control and DDC/CI support.
         2. Main Playback with two 100 mm standard faders.
         3. Four encoders for non-intensity parameter control.
         4. Dedicated high-resolution intensity level wheel.
         5. Backlit Eos keypad.
         6. Built-in keyboard tray.
         7. Dedicated macro buttons.
         8. Solid-state hard drive.
         9. IEC Power Input: 100 to 240 VAC at 50/60 Hz, fused mains power switch, locking regionalized power cable included.
         10. Two individually configurable Gigabit Ethernet ports, RJ45 connectors.
         11. One 802.11ac Wi-Fi Ethernet adapter. To be enabled with future software.
         12. Bluetooth 5.1 for connecting input accessories. To be enabled with future software.
         13. sACN and Art-Net network output protocols.
         14. Four DMX-512 / RDM 5-pin XLR ports.
         15. Contact closure triggers via D-Sub connector.
         16. USB 3.1 ports, for flash drives, pointing devices, keyboards.

USB-A Ports: 5. USB-C Ports: 2.

* + - * 1. One Littlite XLR port.
        2. One Kensington lock port.
        3. Multiple MIDI and/or SMPTE timecode inputs, MIDI In and Out, Analog/Serial Inputs, OSC transmit/receive, UDP transmit/receive through network interface or Response Gateways.

\*\* NOTE TO SPECIFIER \*\* A 2U 19-inch rack-mount controller. Can serve as backup for Ion Xe or Ion Xe 20 lighting control systems. Can function as a stand-alone lighting playback controller. The front panel features twenty user programmable buttons and LED indicators that show mode and status. Eos Family software installed, giving access to all programming functions of full consoles.

* + 1. Product: Ion XE RPU as manufactured by ETC Inc.

\*\* NOTE TO SPECIFIER \*\* Delete model options not required.

* + - 1. Model Ion Xe RPU 2K: Ion Xe Remote Processor Unit, 2,048 outputs, base.
      2. Model Ion Xe RPU 12K: Ion Xe Remote Processor Unit, 12,288 outputs, maximum.
      3. Power consumption: Approximately 2 A at 120 V or 230/240 V.
      4. Ambient Room Temperature: 32 to 95 degrees F (0 to 35 degrees C).
      5. Ambient Humidity: Up to 90 percent non-condensing.
      6. Regulatory Compliance: CE compliant, cETLus listed, UKCA marked, FCC compliant, RoHS compliant, and WEEE.
      7. Hardware and Interfaces:
         1. 2U 19-inch rack-mount form factor.
         2. Supports two external display port monitors (1920 x 1080 min, 3840 x 2160 max). Optional single-touch or multi-touch screen control and DDC/CI support.
         3. Twenty user-programmable front panel buttons.
         4. Six front panel LED status indicators.
         5. USB keyboard. Included.
         6. Solid-state hard drive.
         7. IEC Power Input: 100 to 240 VAC at 50/60 Hz, fused mains power switch, locking regionalized power cable included.
         8. Two individually configurable Gigabit Ethernet ports, RJ45 connectors.
         9. One 802.11ac Wi-Fi Ethernet adapter. To be enabled with future software.
         10. Bluetooth 5.1 for connecting input accessories. To be enabled with future software.
         11. sACN and Art-Net network output protocols.
         12. Four DMX-512 / RDM 5-pin XLR ports.
         13. Contact closure triggers via D-Sub connector.
         14. USB 3.1 ports, for flash drives, pointing devices, keyboards.

USB-A Ports: 5. USB-C Ports: 2.

* + - * 1. Multiple MIDI and/or SMPTE timecode inputs, MIDI In and Out, Analog/Serial Inputs, OSC transmit/receive, UDP transmit/receive through network interface or Response Gateways.

\*\* NOTE TO SPECIFIER \*\* For venues using primarily conventional lighting, the control console provides Eos system features in a simplified package. In addition to keypad commands, true LTP Channel Faders provide hands-on control of intensity and can be used to set manual levels and edit recorded cues and submasters. Virtual moving light controls are available to facilitate the use of conventional accessories like moving mirror heads, color scrollers or gobo rotators, or to make controlling small numbers of moving lights simple and direct. Can be backed up by another Element 2, ETCnomad 6,144 or ETC Puck 6,144 minicomputer.

* + 1. Product: Element 2 as manufactured by ETC Inc.

\*\* NOTE TO SPECIFIER \*\* Delete model options not required.

* + - 1. Model Element 2 1K: Element 2 console, 1,024 outputs, base.
      2. Model Element 2 6K: Element 2 console, 6,144 outputs, maximum.
      3. Power Consumption: Approximately 1.2 A at 120 V or 230/240 V.
      4. Ambient Room Temperature: 32 to 95 degrees F (0 to 35 degrees C)
      5. Ambient Humidity: Up to 90 percent non-condensing
      6. Regulatory Compliance: CE compliant. cETLus listed. UKCA marked. FCC compliant. RoHS compliant. WEEE.
      7. Hardware and Interfaces:
         1. Supports two external display port monitors, 1920 x 1080 minimum to 3840 x 2160 maximum, with optional single-touch or multi-touch screen control and DDC/CI support.
         2. 40, 45 mm standard faders. 100, 10-fader pages configurable as channels, submasters, palettes/presets, timing, and effect rate/speed playback control.
         3. Dedicated fader paging knob, with backlit selection labels.
         4. Main Playback with two 45 mm standard faders.
         5. On-Demand moving light and LED virtual encoders on connected display monitor.
         6. Dedicated high-resolution intensity level wheel.
         7. Eos keypad.
         8. USB keyboard: Included.
         9. Solid-state hard drive.
         10. IEC Power Input: 100 to 240 VAC at 50/60Hz.

Fused mains power switch and Locking regionalized power cable included.

* + - * 1. Two individually configurable Gigabit Ethernet ports, RJ45 connectors.
        2. One 802.11ac Wi-Fi Ethernet adapter to be enabled with future software.
        3. Bluetooth 5.1 for connecting input accessories to be enabled with future software.
        4. sACN and Art-Net network output protocols.
        5. Four DMX-512 / RDM 5-pin XLR ports.
        6. Contact closure triggers via D-Sub connector.
        7. USB 3.1 ports, for flash drives, pointing devices, keyboards (5 USB-A ports, 2 USB-C ports).
        8. One Littlite XLR port.
        9. One Kensington lock port.
        10. Multiple MIDI and/or SMPTE timecode inputs, MIDI In and Out, Analog/Serial Inputs, OSC transmit/receive, UDP transmit/receive through network interface or Response Gateways.

\*\* NOTE TO SPECIFIER \*\* A full-featured mini-computer with an embedded ETCnomad lighting control key capable of running Eos and Element applications. Provides lighting control with conventional and moving lights, media servers and LED luminaires. Can be used in primary, backup, client, and offline environments. Optional fader wings, programming wings, X-keys and compatibility with USB- MIDI panels allow extended and customizable control.

* + 1. Product: ETC Puck as manufactured by ETC Inc.

\*\* NOTE TO SPECIFIER \*\* Delete model options not required.

* + - 1. Model ETC Puck Base: ETC Puck, 1,024 outputs, base.
      2. Model ETC Puck 6K: ETC Puck, 6,144 outputs, maximum.
      3. Power consumption: Approximately 1.6 A at 120 V or 230/240 V.
      4. Ambient Room Temperature: 32 to 95 degrees F (0 to 35 degrees C).
      5. Ambient Humidity: Up to 90 percent non-condensing.
      6. Regulatory Compliance: CE compliant, cULus listed, FCC compliant, RoHS compliant, and WEEE.
      7. Hardware and Interfaces:
         1. Supports one external display port and one external HDMI monitors (1920x1080 minimum, 3840x2160 maximum), with optional single-touch or multi-touch screen control and DDC/IC support.
         2. Solid-state hard drive.
         3. Power Input: 100 to 240 VAC at 50/60Hz, via included power supply and IEC NEMA 15 cord.
         4. Two individually configurable Gigabit Ethernet ports, RJ-45 connectors.
         5. One 802.11ax Wi-Fi Ethernet adapter. To be enabled with future software.
         6. Bluetooth 5.0 for connecting input accessories. To be enabled with future software.
         7. sACN and Art-Net network output protocols.
         8. USB 3.1 ports, for flash drives, pointing devices, keyboards.

USB-A Ports: 3. USB-C Ports: 2.

* + - * 1. One Kensington lock port.
        2. Multiple MIDI and/or SMPTE timecode inputs, MIDI In and Out, Analog/Serial Inputs, OSC transmit/receive, UDP transmit/receive through network interface or Response Gateways.

\*\* NOTE TO SPECIFIER \*\* Eos software for Windows and Mac computers. Free to download. Used to create or edit show files for Eos Family controllers. When ETCnomad key is connected to the computer via USB, the software can directly control conventional and LED luminaires, moving lights, and media servers. The ETCnomad key allows the computer to act as a backup for Eos Family controllers or join larger systems as a client. Without the key, the computer can mirror the connected device. Optional fader wings, programming wings, and OSC programmable devices allow extended and customizable control.

* + 1. Product: Eos Software and ETCnomad Key as manufactured by ETC Inc.

\*\* NOTE TO SPECIFIER \*\* Delete model options not required.

* + - 1. Model ETCnomad Base: ETCnomad key for Eos macOS/Windows software, 1,024 outputs, base.
      2. Model ETCnomad Unlocked: ETCnomad key for Eos macOS/Windows software, 6,144 outputs, unlocked.
      3. Model GADGET2: Gadget II, USB to 2 ports DMX-OUT.
      4. Hardware Requirements:
         1. Multicore processor with clock frequency higher than 2.0 GHz.
         2. Free Disk Space: 3.5 GB or higher.
         3. RAM: 2 GB or higher.
         4. Screen Resolution: 1920x1080 or higher.
         5. Video Card: 64 MB or higher.
         6. Direct X 11 or higher installed; Windows only.
         7. RJ-45 Ethernet network adapter. Required to communicate with a lighting network and gateways for output.
         8. USB-A ports for connection of ETCnomad key and output accessories.
      5. Compatibility:
         1. Compatible with Eos, Cobalt, and Hog 4 PC.

Cobalt software is not compatible with macOS Catalina 10.15 and later.

* + 1. Product: Eos Remote Interface as manufactured by ETC Inc.
       1. Model EOS REM INT: Eos Remote Interface.
       2. Power consumption: Approximately 1 A at 120 V or 230/240 V.
       3. Ambient Room Temperature: 32 to 95 degrees F (0 to 35 degrees C).
       4. Ambient Humidity: Up to 90 percent non-condensing.
       5. Regulatory Compliance: CE compliant, cETLus listed, UKCA marked, FCC compliant, RoHS compliant, and WEEE.
       6. Hardware and Interfaces:
          1. 2U 19 inch rack-mount form factor.
          2. One 5 inch high-resolution front panel display, with multi-touch and haptic touch feedback.
          3. Supports three external display port monitors (1920 x 1080 min to 3840 x 2160 maximum), with optional single-touch or multi-touch screen control and DDC/CI support.
          4. One dimmable warm-white LED accent light.
          5. Solid-state hard drive.
          6. IEC Power Input: 100 to 240 VAC at 50/60 Hz; fused mains power switch, locking regionalized power cable included.
          7. Two individually configurable Gigabit Ethernet ports, RJ45 connectors.
          8. One 802.11ac Wi-Fi Ethernet adapter; to be enabled with future software.
          9. Bluetooth 5.1 for connecting input accessories; to be enabled with future software.
          10. USB 3.1 ports, for flash drives, pointing devices, keyboards.

USB-A Ports: 5. USB-C Ports: 3.

* + - * 1. One Kensington lock port.
    1. Product: Eos Motorized Fader Wings as manufactured by ETC Inc.
       1. Provide extended playbacks for Eos Apex, Eos Ti, Gio, Gio @5, Ion Xe, Eos, Family Processors Remote Interfaces, ETC Puck (PC or Mac native) and ETCnomad Puck.
       2. Provides power sensing and automatically turns on when both an active USB data connections and mains power are provided via the external 12 V power supply.
          1. Connected devices must be running Microsoft Windows 7 or higher or Mac OSX El Capitan 10.11 or later.
          2. Not compatible with Windows XP.
          3. Not supported on Element or any Windows XP devices.
          4. Cannot be connected to a host computer using a KVM switch.

\*\* NOTE TO SPECIFIER \*\* Delete model option not required.

* + - 1. Model Eos MFW 10: Eos Motorized Fader Wing 10.
         1. 60 mm motorized faders. Quantity: 10.
         2. 4.3 inch full-color high-resolution displays. Quantity: 2.
         3. Control buttons. Quantity: 30. 3 control buttons per Fader.
      2. Model Eos MFW 20: Eos Motorized Fader Wing 20.
         1. 60 mm motorized faders. Quantity: 20.
         2. 4.3 inch full-color high-resolution displays. Quantity: 4.
         3. Control buttons: 60. 3 control buttons per Fader..
      3. Model Eos FW 40: Eos Standard Fader Wing 40.
         1. 45 mm Faders: Quantity of 40.
         2. 4.2 inch High-Resolution Monochrome LCDs: Quantity of 4.
         3. Control Buttons: Quantity of 2 control buttons per fader.
      4. Model Eos FW 20: Eos Standard Fader Wing 20.
         1. 45 mm Faders: Quantity of 20.
         2. 4.2 inch high-resolution monochrome LCDs: Quantity of 2.
         3. Control Buttons: Quantity of 2 control buttons per fader.
      5. Up to three wings may be attached to any of these devices.
      6. Regulatory Compliance: CE compliant. cETLus listed.
      7. Power sensing. Automatically turns on when both an active USB data connection and mains power are provided via the external 12 V power supply.
      8. Connected devices must run Microsoft Windows 7 or higher or Mac OSX El Capitan 10.11 or later. Not compatible with Windows XP.
      9. Features:
         1. Pageable playbacks; 100 pages are supported.
         2. Paging/bank conventions are determined in a setup menu.
         3. Button/fader and configuration mapping displayed via high resolution displays.
         4. Two powered USB ports.
         5. VESA 100x100 mm mountable.
         6. Kensington Lock compatible locking point.
      10. Interfaces:
          1. AC Input: 100 to 240 VAC at 50/60 Hz with external power supply.
          2. USB Ports: Two.
    1. Product: Eos Programming Wing as manufactured by ETC Inc.
       1. Model Eos PGW: Eos Programming Wing.
       2. Can be used as a USB-attached programming face panel for Apex Processor, Ion Xe RPU, Remote Interface, ETC Puck, ETCnomad computers (PC or Mac), Eos RPU3, or RVI3. The Programming Wing is not compatible with ETC hardware that contains a dedicated face panel, such as a control console.
       3. Connected Devices: Windows 7 or higher or Mac OSX El Capitan 10.11 or later.
          1. Not compatible with Windows XP or earlier Microsoft operating systems.
       4. Power Sensing: Automatically turns on when an active USB data connection and mains power is provided via the external 12 V power supply.
       5. Regulatory Compliance: CE compliant and cETLus listed.
       6. Features:
          1. Same keypad layout as other Eos Family consoles.
          2. Backlit keys.
          3. Main fader pair.
          4. Four DMX512/RDM ports.
          5. Contact closure trigger.
          6. Two powered USB ports for connectivity.
          7. One USB port to store and secure an ETCnomad Dongle.
          8. One Littlite connection.
          9. VESA 100 x 100 mm mountable.
          10. A Kensington Lock compatible locking point.
       7. Interfaces:
          1. AC Input (100 240 VAC at 50/60 Hz) with external power supply.
          2. DMX512/RDM Ports: Four.
          3. USB Ports: Three.
          4. Contact closure trigger.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. SOFTWARE FOR ENTERTAINMENT CONTROLS (EOS)
     1. Lighting Control Desk: A microprocessor-based system providing control of stage, studio, and entertainment lighting systems.

\*\* NOTE TO SPECIFIER \*\* Delete console model not required.

* + - 1. Console Model: Eos Apex 20 as manufactured by ETC Inc.
      2. Console Model: Eos Apex 10 as manufactured by ETC Inc.
      3. Console Model: Eos Apex 5 as manufactured by ETC Inc.
      4. Console Model: Eos Apex Processor as manufactured by ETC Inc.
      5. Console Model: Gio @5 24k as manufactured by ETC Inc.
      6. Console Model: Gio @5 4k as manufactured by ETC Inc.
      7. Console Model: Ion Xe 20 12k as manufactured by ETC Inc.
      8. Console Model: Ion Xe 20 2k as manufactured by ETC Inc.
      9. Console Model: Ion Xe 12k as manufactured by ETC Inc.
      10. Console Model: Ion Xe 2k as manufactured by ETC Inc.
      11. Console Model: Ion Xe RPU 12k as manufactured by ETC Inc.
      12. Console Model: Ion Xe RPU 2k as manufactured by ETC Inc.
      13. Console Model: Element 2 6k as manufactured by ETC Inc.
      14. Console Model: Element 2 1k as manufactured by ETC Inc.
      15. Console Model: ETC Puck 6k as manufactured by ETC Inc.
      16. Console Model: ETC Puck 1k as manufactured by ETC Inc.
      17. Console Model: ETCnomad 6k as manufactured by ETC Inc.
      18. Console Model: ETCnomad 1k as manufactured by ETC Inc.

\*\* NOTE TO SPECIFIER \*\* Delete output options not required.

* + - 1. Output: Eos Apex 20: 24,576.
      2. Output: Eos Apex 10: 24,576.
      3. Output: Eos Apex 5: 24,576.
      4. Output: Eos Apex Processor: 24,576.
      5. Output: Gio @5 24k: 24,576.
      6. Output: Gio @5 4k: 4,096.
      7. Output: Ion Xe 20 12k: 12,288.
      8. Output: Ion Xe 20 2k: 2,048.
      9. Output: Ion Xe 12k: 12,288.
      10. Output: Ion Xe 2k: 2,048.
      11. Output: Ion Xe RPU 12k: 12,288.
      12. Output: Ion Xe RPU 2k: 2,048.
      13. Output: Element 2 6k: 6,144.
      14. Output: Element 2 1k: 1,024.
      15. Output: ETC Puck 6k: 6,144.
      16. Output: ETC Puck 1k: 1,024.
      17. Output: ETCnomad 6k: 6,144.
      18. Output: ETCnomad 1k: 1,024.
      19. The following items may be contained in non-volatile electronic memory and stored to an onboard solid-state hard drive or to any USB storage device.
          1. Cues: 100,000. Cue Lists: 999. Groups: 10,000. Presets: 10,000 presets. Palettes: 4 x 10,000 (Intensity, Focus, Color and Beam). Macros: 99,999. Effects: 10,000. Curves: 10,000. Color Paths: 10,000. Snapshots: 10,000.
      20. Recorded cue lists: May be played back simultaneously on up to 200 faders.
          1. HTP/LTP intensity flags, assert, proportional, intensity master or manual master fade control and priority status may be placed on each cue list.
          2. A cue list may contribute to playback background states or to withhold such contributions.
      21. Channels: Are to, by default, respond to cue information by last instruction, with discrete rate control provided for all cues.
      22. The desk may be placed in Tracking or Cue Only mode by the user as a system default and overridden on individual record actions as required.
      23. Control and programming features for automated fixtures: Include the following.
          1. Standard library of fixture profiles. The ability to copy and edit existing profiles and create new profiles. Patch displays including channel and output addressing. 24-bit fade resolution. Color characterization allowing color mixing and matching to color media data.
      24. Displays: Three user definable work spaces, providing individually configured frames, with size/scaling controls.
      25. Help Feature: Context sensitive. Explain and provide operation examples of system features. To be integrated into the on-board user manual via hyperlinks.
      26. A fully integrated Virtual Media Server feature shall allow the user to map images and animations to a rig array. Forty such maps may be created, each with twelve layers. Systems that rely on external hardware or software for this functionality shall not be acceptable.
      27. Fully integrated 3D visualization and programming environment included. Includes tools for programming fixed-focus and moving fixtures, including ability for straight-line focus moves, click-to-focus, and integration with personal device apps that allow finding the devices' location in real space and automatically adjusting moving fixtures to point at the location. The 3D environment receives its data from the internal programming of the lighting controller, not by monitoring the output levels being sent to the lighting system. The 3D environment displays a replica of live output to the lighting system, and displays recorded states in Blind, for the user to preview and modify the lighting states without changing live output to the lighting system.
      28. Software Upgrades: By user via USB flash drive. Install software updates in all desks, processor units and video remotes from one device over the network.
      29. The device operating software shall be loaded into program execution memory from the internal hard drive when the desk is powered. In the event of an uncontrolled shutdown, the device shall return to its last output state when power is restored. Devices requiring a UPS to provide such protections shall not be acceptable.
      30. Output shall be distributed over a 100/1000/10000 Mbps Ethernet network using Streaming ACN (sACN), and/or Art-Net protocols. The user shall be able to control the application of protocols at an individual address level.
      31. Output shall additionally be allowed via local ports utilizing the USITT DMX512-A output protocol, where the lighting console has these ports installed.
      32. The system shall support full bi-directional RDM communication with compatible devices via ETC Net3 and Response DMX/RDM Gateways. RDM communication shall adhere to ANSII standard E1.20-2006 Entertainment Technology RDM Remote Device Management Over DMX512 Networks. Supported RDM features shall include:
          1. Discovery and Identification of RDM-capable devices.
          2. Setting of start addresses, operating modes and additional settings as exposed by connected devices and controllable via RDM.
          3. Viewing of sensor data as provided by connected devices.
          4. Error reporting as provided by connected devices.
      33. Integrated power control monitoring features shall be provided to allow indication of power control system status, error states and circuit load monitoring. Adjustment of circuit configuration from the console shall also be supported. Communications with the power control system shall utilize ANSI E1.17 2006 Entertainment Technology Architecture for Control Networks.
      34. Show data may be created and modified on a personal computer, using Windows 7 64-bit or higher operating systems, with a free offline editing application. The offline editor may also run natively on Macintosh platforms using OS 10.14 (Mojave) or later. The program shall also allow output to visualization software supporting the same protocols as the lighting system, without the need for additional keys or hardware. Systems that do not offer visualization output from a personal computer without additional keys or hardware shall not be acceptable.
      35. PC: Windows 7, 64-bit or higher. Macintosh computer: OS 10.14 running a client software application. Connect to a control system via the network and view or modify current show data in an independent display environment, using an ETCnomad license key. When connected without the key, the computer shall operate in Mirror Mode, with the device to be mirrored selectable by the user.
      36. Synchronized backup shall be provided via another full desk on the network, a processor unit or a PC/Mac using ETCnomad. The backup unit shall maintain synchronized playback with the host controller and shall take over control of the lighting system upon loss of communication with the host controller, either automatically or upon user confirmation. Use of two processor units to service and backup system output is also supported.
      37. A maximum of 99 users may access and interact with show data simultaneously. Each user shall have an individual workspace. User identification may be assigned to more than one control device, allowing users to work in tandem, or allowing a designer/ALD to mirror the current display format, mode, and command line of the associated programmer. Partitioned control allows discrete control of channel/parameter groupings by user. Partitioned control may be easily enabled and disabled with no need to merge show data from multiple users.
      38. Show files are saved across the system to all available integral hard drives simultaneously.
      39. Support 32 individual simultaneous Time Code inputs or Event lists.
      40. Controls and Playback:
          1. Manual Control and Programming Section:

The programming keyboard shall be grouped by function. Major groupings shall be recording target functions, numeric keys, level assignment functions, display navigation functions and controls, as well as non-intensity parameter controls.

The command keypad shall be fully interactive with the virtual controls, such as color pickers and direct selects. The command keypad shall allow navigation of virtual fields on displays and in dialogues, reducing the need for a pointing device.

Provide direct select virtual controls, which provide "one touch" selection of channels, groups, palettes, presets, effects, snapshots, magic sheets, and macros. Labels and icons may be applied to the targets for quick reference, with a stock library of common images included, and custom images easily importable. The user shall be able to create custom direct selects, with any arrangement and combination of controls.

Non-intensity parameters may be set numerically via an extensible keypad on the main display. This control shall be fully interactive with the page-able encoders. The display associated with the encoders shall display the current encoder function. The touch screen shall also access available modes for each parameter type, min, and max values for each parameter as applicable, as well as home position on a parameter basis.

Only those parameters available for control in the active lighting system shall be displayed for control. Displays shall lowlight parameters not available to selected channels. Alternatively, the encoders may be placed in a state allowing parameters not applicable to the current selection to be suppressed.

Lamp controls provide direct access to luminaire functions such as striking and dousing arc lamps and calibrating entire fixtures or individual mechanisms of fixtures, as provided by the luminaire manufacturer. User access to these features is normalized across all manufacturers for ease of use. Use of a "control channel" for accessing these functions shall not be required and systems requiring use of control channels for these functions shall not be acceptable.

Fan functions shall be provided both via command line operation and through encoder controls.

Highlight shall be supported, with user definable highlight values. Lowlight conditions may be defined for selected, but not specified channels. Rem Dim commands, at specific levels by channel, may be optionally and automatically called with the highlight command.

Fixtures with color mixing may be set with direct additive or subtractive encoder controls or the command line, as well as via the color pickers. Six optional color spaces are supported, as well as tinting tools, and spectrum tools for systems with more than two color mixing elements. Color may also be set directly to a gel match via a graphic selection tool or from the command line. The gel picker shall support tools for identifying similar colors, show favorites, and graphic indications of gel locations. Color Path tools, with intensity dampening, shall be provided.

The Virtual Media Server function shall allow the user to create two-dimensional layouts of devices, identified as pixel maps. Media content (images, movies, text, and procedurally generated effects) may then be applied, manipulated and stored. Stock content is provided and the user may import custom imagery and animations.

Macros shall allow the user to create strings of commands, and replay them manually or triggered by a cue, a submaster, or an outside source via OSC or sACN input. By default, macros triggered manually shall post to the command line, but those executed via cue lists shall run in the background. The user may override this behavior by defining the macro to always execute in the foreground or background, regardless of the recall method. Startup, Shutdown and Disconnect macros may also be defined.

Playback Section

Up to 1,000 playback faders may be defined on the fader array, on pages of ten faders each.

Faders may be grouped for playback, with sliders and button action defined by the user.

Instantaneously halt an active cue, back to the previous cue, manually override the intensity fade or manually override the entire fade or go to a cue at a specified percentage of completion.

Cue list to contribute to background state or for the contents of each cue list to be withheld from such.

Priority and background priority states may be established.

Playback Faders: To have the following associated controls:

Freeze: Halts fader output

Stop Effect: Stops action of an effect.

Filter: Assigns fader filter states.

Go To Cue 0: Reset a cue list.

Off: Turns off contents of a playback, releasing control to the background state or to set to null.

Assert: Replays an active cue.

Release: Releases control to background and resets the cue list.

Timing Disable, channel filters and independent status may also be defined.

The potentiometer shall be configurable as a proportional master, an intensity master, or manual master. Support for rate, effect rate, effect size and Master Only controls is also provided. Filtered manual timing masters and effects masters may be configured.

Rate Override / Fader Paging: Supported with associated controls.

* + - * 1. Submasters:

Up to 999 proportional, fully overlapping additive, effect or inhibitive submasters may be defined. Submasters shall use system-defined colored graphics and LEDs, where available, to indicate submaster status. Each submaster may have fade up, dwell and down fade times. Submasters may be set to priority and background priority status.

Submasters may be set to HTP or LTP intensity. Non-intensity parameters on submasters shall be LTP only.

Exclusive mode for a submaster shall prohibit the live contribution of that submaster from storing to cues or other submasters. Shield mode prohibits access of associated channels from any other playback or manual control operations.

A submaster potentiometer may be defined as proportional, master only or intensity master. When set as an Intensity Master, a mark and unmark feature is supplied.

Motorized faders shall set submasters to required positions as fader pages are changed. Upon a page change, non-motorized faders shall blink the associated indicator LED, and display an arrow graphic to indicate the direction the user must move the fader to match the newly mapped content. The user shall not gain control of the content until the non-motorized fader has matched the content's value.

The submaster blind buffer shall be linked directly to live playback.

Set submaster values directly from the command line.

LTP submasters may be set to fade to background or to minimum value when the fader is returned toward zero.

Submaster values may contribute to the background state or be withheld.

* + - * 1. Grand Master Fader

The location of the Grand Master shall be user definable. The grand master shall have associated blackout and blackout enable buttons.

Blackout shall send all associated intensity outputs to zero. Non-intensity outputs shall not be affected.

Lighting control devices with motorized faders shall set the grand master to required positions as fader pages are changed.

If the Grand Master Fader is set below 100 percent, the system shall display a virtual fader on all monitors, for access when the Grand Master is located on a fader page that is not visible.

* + - 1. Display Controls:
         1. Format shall change the view of selected displays.
         2. It shall be possible for the user to choose which parameter categories or parameters they wish to display. Parameters and categories shall have adjustable column widths.
         3. Flexichannel modes shall change which channels are viewed in selected displays, as follows:

No modes

Parent channels only / cell channels only

Use Partitions

Flexichannel states shall change which channels are viewed in selected displays, modified by the flexi modes, as follows:

All channels

Patched channels.

Show channels.

Active/Moved channels.

Selected channels.

Manual Channels.

View channels; user identified list.

Channels with discrete timing.

* + - * 1. Expand shall extend the selected view sequentially across connected displays.
        2. "Time" depressed shall display discrete timing data. "Data" suppressed shall display absolute values of referenced data. These controls may be latched.
        3. Displays may be toggled to show stored data currently manually overridden, the source of the current parameter data, output level, patch assignment, part structure and referenced marking data. These controls may be latched.
        4. User definable magic sheets shall provide alternative display of and access to channels and record targets. Multiple magic sheets may be created, each with a variety of zoom and placement factors for rapid recall of the required view. User-definable, interactive displays may be created. These displays, which can be used in live and blind operating modes, allow graphical layout of channels, desk buttons and programming tools. Standard symbols are provided, and the user may import their own symbols or graphics. Each symbol may be individually defined with data feedback characteristics. Non-interactive status information, such as a mirror of other user's command lines, may also be included in the display. A graphical browser is provided for fast selection of these views. Multiple zoom factors and placements may be stored and recalled for each display.
        5. Playback status displays are provided with a variety of different formats. Indications are provided per cue for live moves, lights fading from zero and moving non-intensity parameters, and dark moves, inactive lights which have stored non-intensity parameter moves. The user may select a static or dynamic time display in the cue list itself.
        6. Display content including which of the workspaces is in focus on any of the monitors and what views are docked in those workspaces may be instantly recalled using snapshots.
      1. Operating Modes:
         1. Live Mode:

Channel lists may be constructed using the +, -, and Thru keys as well as the direct selects. Channel selection is fully interactive, regardless of the method used.

Levels may also be set with the keypad, level wheel and non-intensity encoders. "Selected" channels shall be those last addressed and under keypad control. Controls are provided for single button access to the last selected channel list, all channels with manual levels and all active channels.

Channels may be set at a user defined default level using the Level key. + percent and percent keys adjust channels quickly by user definable values.

Channels and/or channel parameters may be captured. Capture mode shall allow the user to selectively capture channel data at specific levels. Captured data shall be indicated on the Live display.

Sneak is used to restore specified channels to background states, default values, or send them to specified values, in user specified times.

Selected channels may be set at a level or held to current values while other channels are set to zero using Rem Dim. Toggling Rem Dim restores unselected channels to original levels. The Rem Dim level shall be user definable via the command line or with a default setup value.

Channels may be recorded into groups for fast recall of commonly used channels. 10,000 groups shall be available. Groups shall store selection order and subgrouping functions. The Offset function supports rapid creation of ordered groups, including reverse and random order.

Parameter Settings: Stored to Intensity, Focus, Color, Beam Palettes, and to Presets. Referenced data may be stored to whole numbers or up to thousandths decimal places between each whole number.

The following conditions may be placed on a channel or channel parameter to be included with a cue record action.

Discrete fade time and/or delay.

Block flag.

Assert flag.

IFCB Filters, which may be set at a parameter level.

Release and restore.

999 cue lists may be stored. Cues may be recorded in any order. Up to thousandth decimal cues may be inserted between any two whole number cues. Each cue may contain a maximum of twenty parts.

It shall be possible to record cues and cue parts with the following information:

Any collection of channel data, as determined using "Record", "Record Only" or selective store commands, combined with parameter filters - including Effects.

Cue Level timing and delays for Intensity Up, Intensity Down, Focus, Color and Beam.

Follow or hang time.

Link instruction.

Loop value.

Block, Assert, Preheat, Release, and/or Mark Flag.

Curve.

Rate.

Allfade.

Label and note.

Alert countdown time.

Timecode playback stamp.

Scene label; cues only, not cue parts.

Execute commands to trigger other activity; execute cue lists, cues, macros, snapshots, OSC and UDP strings, and MIDI raw commands.

Cue list partitions shall be available to filter list content.

Channel parameters may be stored with an effect instruction. Effects may contain relative offsets from current value, or absolute instructions. Effects may be progressive actions or on/off states. Entry and exit behaviors modify the channel parameters activity when beginning and ending the effect. Channel and cue level overrides are provided.

Non-intensity channel parameters may be marked (pre-set), in two ways. Automark pre-sets any parameter transitions in the cue just prior to intensity becoming active. Automark may be disabled on a cue or cue part basis, enabling a "live" move. Alternatively, non-intensity parameters may be marked to a specific cue with a single command instruction. It shall not be necessary to store or update these parameters directly into the cue in which the movement is to occur.

Update may be used to selectively add modified parameter data quickly to that parameter's current source. Trace may be used to modify the data to the original source of its move instruction. It shall be possible to update inactive record targets. A context sensitive display provides detailed information regarding the results of the update command.

Recall From quickly pulls specified data from record targets or other channels into the current view. Recall on an HTP basis shall be provided.

Copy To quickly copies selected data to specified channels or other record targets.

Address and channel check functions shall be provided.

Channel parameters may be "parked" at levels. Those levels are not added to any live record operations, nor may they be changed until the parked element is "unparked". Scaled park provides real time proportional adjustment of stored intensity values. Address Park shall also be provided.

About shall provide detailed status of selected channels or specified record targets. This shall include current source, current value, discrete timing, parked value, marked to and for indications. Background levels and current DMX output are also displayed. Channel usage indicates submaster and cue information and provides a "dark moves" report on a per channel basis.

10,000 snapshots may be stored which instantly recall specified front panel and display configurations.

Query shall allow selection of channels by their current or possible state. Keywords and fixture types shall allow quick access to fixtures.

User definable home positions, on a per channel basis, may be defined.

Undo shall be used to sequentially step back through manual operations or to undo record and delete actions. It shall be possible to undo multiple commands in one action.

* + - * 1. Blind Mode:

The Blind display allows viewing and modification of all record targets without affecting stage levels.

Record target data may be displayed in a summary view, a detailed table orientation or a spreadsheet view, which allows quick data comparisons, move, and replace functions.

Changes to blind data shall be automatically stored. Range selection of both record targets and channels shall be supported.

* + - * 1. Staging Mode:

Staging mode shall allow temporary changes to be made to the lighting system, which are only displayed on Live and Blind displays and represented in the 3D environment, without changing the live output to the lighting system, so that the user may preview changes before committing them to output.

Staging mode shall be accessible in Live or Blind mode, and the user shall be able to abandon or commit changes to the live output or to the stored database separately. The user may leave Staging mode, and the buffer shall remain until the user clears the changes.

* + - * 1. Patch Display:

Patch shall be used to display and modify the system control channels with their associated library data.

Each channel may be provided with a proportional patch level, curve, label, swap and invert functions, Live/Dark flag enable/disable, as well as keywords to service Query.

A full library of profiles is provided, with the ability for the user to define "favorites" for fast selection. The user may also modify library profiles or create new profiles, to function with any controlled device.

Offset functions in patch shall allow selection of channel ranges and shall allow the user to establish a "custom" footprint for any device output.

Custom color wheels, color scrolls and gobo wheels shall be defined in patch. These devices shall be created with a simple table and graphical user interface supported by images of major manufacturers.

The user may define or modify color configuration for parameters of color-changing fixtures, allowing the color picking tools to accurately control a fixture's color system.

RDM discovery, patching and device monitoring shall be supported.

Copy to, Swap and Move functions shall be supported in patch.

* + - * 1. Setup/Browser:

Access system, user, and device configurations.

Possible to partially merge show files. Users may select as much or as little of the show file as required, with renumber tools.

Import ASCII and Lightwright data files. Export as ASCII or .csv.

Access for show data storage, import, export, print to .pdf and clear functions, as well as show data utilities.

Support programming and playback of real time clock events, including cue, submaster and macro execution at specific times of specified days or at a time based on astronomical events.

Control screen: For network configuration, selecting date/time, software update controls, selecting functional language and/or keyboard for labeling option, and other system level tools.

Languages for prompts, advisories, and help: English, Bulgarian, German, Spanish, French, Italian, Polish, Slovenian, Russian, Japanese, Chinese simplified, Chinese traditional, and Korean.

Supported keyboards: Latin American, American International, United Kingdom, French, German, Italian, Korean, Norwegian, Russian, Slovakian, Turkish, Swiss, Swedish, Finnish, and Bulgarian.

* + - 1. Output and Integration of Power Control Monitoring and Configuration:
         1. Lighting Control System: Provides communication with an ETC Sensor+ and Sensor3 dimming systems for remote monitoring and configuration of show specific functions from within the software application.
         2. Circuit Level Configuration and Monitoring Functions Not Limited To:

Control mode; dimmable, switched, latch-lock, always on, off or fluorescent.

Curves.

Control threshold.

Min and Max Scale Voltage.

Preheat.

Scale load.

* + - * 1. Rack status messages Not Limited To:

State of UL924 panic closure.

DMX port error/failure.

Network error/failure.

A, B, C Phase below 90 or above 139 volts and headroom warning.

Ambient temperatures out of range.

* + - * 1. Circuit status N limited to:

Module type and location.

Output level.

Control Source.

Overtemp.

* + - * 1. Advanced circuit feedback Not limited to:

Load higher or lower than recorded value.

DC detected on output.

SCR failed on/off.

Breaker trip.

Module has been removed.

Load failure.

* + - * 1. Shutdown due to Overtemp.
  1. ENTERTAINMENT CONTROLS (MULTIVERSE)

\*\* NOTE TO SPECIFIER \*\* The first building block of the Multiverse system. Each Multiverse Node is a transceiver. As a single universe transmitter, it functions in a similar plug and play manner to the Multiverse® SHoW Baby® and legacy SHoW DMX SHoW Baby® products, and has a full user interface, with four buttons and a backlit LCD display. Options for built-in radios, 2.4GHz for worldwide use and 900 MHz for use in the Americas only, which allow the user to select which single universe to transmit, and which radio band to use via the SHoW ID. As a receiver, the Multiverse Node is the primary single universe standalone receiver in the Multiverse system and can be part of a larger multi-universe setup. Delete if not required.

* + 1. Product Multiverse Node as supplied by ETC Inc.

\*\* NOTE TO SPECIFIER \*\* Delete model option not required.

* + - 1. Model:5902, 900 MHz / 2.4 GHz.
      2. Model:5903, 900 Mhz.
      3. Use Environment: Indoor.
      4. Regulatory Compliance: FCC and IC. IP Rating: IP50.
      5. Warranty: One year.
      6. Physical:
         1. Length: 4.05 inch (102.8mm). Width: 2.36 inch (60 mm). Height: 1.44 inch (36.47 mm) 1.44 inch.
         2. Antenna: 3dBi.
         3. User Interface: 4 Button/Backlit LCD display.
         4. Construction: Die Cast Aluminum, Black.
         5. Power Connector: Locking DC Jack, 5.5 x 2.1 mm, center positive, 12.1 mm mating depth.
      7. Electrical:
         1. Power: 5 to 30 VDC, 1W.
         2. Broadcast Power: 3.2 mW, 10 mW, 32 mW, and 100 mW.
         3. Broadcast Modes: Adaptive, Full, Low, Mid, High, Max.
         4. DMX Burst Modes: Auto dynamic.
         5. Ethernet Protocols: N/A.
         6. SHoW IDs: Multiverse: 307; Neo: 70.
         7. RF Sensitivity: -95 dBm.
         8. RDM Features: RDM Proxy and RDM Responder.

\*\* NOTE TO SPECIFIER \*\* A wireless DMX transceiver that delivers plug and play wireless DMX and RDM transmission. Default mode works exactly like SHoW Baby 6 with six user selectable SHoW IDs. By connecting an RDM controller, like DMXcat®Multi-Function Test Tool, all 2.4 GHz Multiverse SHoW IDs are accessible. Users can add to their existing systems, build new single universe Multiverse systems, or use as a receiver on multiple universe systems with a Multiverse Transmitter. Delete if not required.

* + 1. Product Multiverse SHoW Baby as supplied by ETC Inc.
       1. Model: 5900. Frequency: 2.4 GHz. Universes: 1.
       2. Use Environment: Indoor.
       3. Regulatory Compliance: FCC, IC, CE, ARIB, and RoHS. IP Rating: IP50.
       4. Warranty: One year.
       5. Physical:
          1. Length: 3.625 inch (92 mm. Width: 3.0 inch (76 mm). Height: 1.8 inch (46 mm).
          2. Antenna: 2 dBi.
          3. User Interface: One button/indicator lights.
          4. Construction: Injection molded plastic, black.
          5. Power Connector: 5.5 x 2.1mm, center ' positive, 9 mm mating depth.
          6. Data Connector: Neutrik 5P XLR Connectors for DMX IN and DMX OUT.
       6. Electrical:
          1. Power: 5 to 30 VDC, 1W.
          2. Broadcast Power: 2.5 mW, 8 mW, 25 mW, and 80 mW.
          3. Broadcast Modes: Adaptive, Full, Low, Mid, High, and Max.
          4. DMX Burst Modes: Auto dynamic.
          5. Ethernet Protocols: N/A.
          6. SHoW IDs: Multiverse: 307; Neo: 70.
          7. RF Sensitivity: -95 dBm.
          8. RDM Features: RDM Proxy and RDM Responder.

\*\* NOTE TO SPECIFIER \*\* Its Ethernet input allows it to take in Streaming ACN (sACN) or Art-Net and to transmit nine user-selectable universes of DMX/RDM, using less radio energy than a present-day single universe wireless DMX transmitter. Each Multiverse Transmitter has a built in Bluetooth radio receiver allowing it to communicate with City Theatrical's multi award winning DMXcat® app from the user's smartphone. This gives smartphone control of any lighting fixture that is part of the Multiverse setup. Wi-Fi enabled, allowing for communication and control from tablet-based Wi-Fi lighting controllers like Luminair. Delete if not required.

* + 1. Product Multiverse Transmitter 2.4 GHz (x2) as supplied by ETC Inc.
       1. Model: 5911. Frequency Range: 2.4 GHz (x2). Universes: 10.
       2. Use Environment: Indoor.
       3. Ambient Room Temperature: 32 to 104 degrees F (0 to 40 degrees C).
       4. Regulatory Compliance: FCC, IC, CE, ACMA, ARIB, cETLus Listed, and RoHS. IP Rating: IP50.
       5. Warranty: One year.
       6. Physical:
          1. Length: 7.75 inch (196.9 mm). Width: 4.0 inch (101.5 mm). Height: 1.85 inch (47 mm).
          2. User Interface: DMXcat app for iPhone, Android, or Amazon Fire. Free download.
          3. Construction: Die cast aluminum.
          4. Antenna: RP-SMA Female.
          5. AC: powerCON TRUE1 in/thru.
          6. DC: Locking DC Jack, 5.5 x 2.1 mm, center positive, 12.1 mm mating depth; EtherCON.
       7. Electrical:
          1. Power: 100 to 240 VAC 50/60Hz, 5 to 30 VDC. PoE Class 0, 0.5 W max.
          2. Broadcast Power: 3.2 mW, 10 mW, 32 mW, and 100mW
          3. Broadcast Modes: Adaptive, Full, Low, Mid, High, and Max
          4. DMX Burst Modes: Auto dynamic.
          5. Ethernet Protocols: 802.11 bgn, 100 BASE-T sACN, Art-Net.
          6. SHoW IDs: 147.
          7. Latency: 4 ms average.
          8. RF Sensitivity: -95 dBm.
          9. RDM Features: RDM Proxy and RDM Responder.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required or delete products not required.

* 1. ENTERTAINMENT CONTROLS (NETWORKING)
     1. Cloud-Based Monitoring System for Lighting and Rigging Systems:
        1. Basis of Design: ETC Sitelink as manufactured and supplied by ETC Inc. Consists of the ETC SiteBox dedicated hardware and an ongoing scalable and flexible subscription plan. The first year of the subscription plan is included with the initial purchase of the first ETC SiteBox for the site.

\*\* NOTE TO SPECIFIER \*\* Update "ETC SiteBox Connections" to reflect the number of ETC SiteBoxes required up to a maximum of 10. An ETC SiteBox is required for every discrete network to be monitored. Delete subscription plans not required.

* + - * 1. ETC SiteLink Subscription Plans:

Basic:

Model: ETCSLBM.

Number of Users: 2.

ETC SiteBox Connections: 3.

Basic device status monitoring.

System email alerts.

Solo:

Model: ETCSLSM.

Number of Users: 5.

ETC SiteBox Connections: 3.

Basic device status monitoring.

System email alerts.

Device specific email and SMS alerts.

sACN Viewer.

Advanced DMX Gateway Monitoring.

Advanced Monitoring: For 1 ETC product line.

Trio:

Model: ETCSLTM.

Number of Users: 10.

ETC SiteBox Connections: 3.

Basic device status monitoring.

System email alerts.

Device specific email and SMS alerts.

sACN Viewer.

Advanced DMX Gateway Monitoring.

Advanced Monitoring: For 3 ETC product lines.

Ultra:

Model: ETCSLUM.

Number of Users: 25.

ETC SiteBox Connections: 3.

Basic device status monitoring.

System email alerts.

Device specific email and SMS alerts.

sACN Viewer.

Advanced DMX Gateway Monitoring.

Advanced Monitoring: For all ETC product lines; present and future.

\*\* NOTE TO SPECIFIER \*\* Delete options not required.

Add-On Options:

\*\* NOTE TO SPECIFIER \*\* Additional users are only available to be added at subscription start by the end user. Use the following point to specify how many additional users are expected to be present.

Additional Users: Can be added in groups of 5, 10, or 25 by the end user at any time up to a total of 250 users.

\*\* NOTE TO SPECIFIER \*\* The following add-on is required if the ETC SiteBox connections listed in the subscription plan is greater than 3. 10 connections is the maximum allowed per site. Delete add-on if not required.

Additional ETC SiteBoxes Connections: Unlocks allowed connections from 3 to 10. For monitoring multiple networks or venues at the same site.

\*\* NOTE TO SPECIFIER \*\* For Basic Plan, delete the following product lines section. For Solo Plan, select one of the following items. For Trio Plan, select three of the following items. For Ultra Plan, leave the following section unchanged.

ETC Product Lines:

ETC Rigging Systems.

Paradigm Control Systems.

Mosaic Control Systems.

Eos Control Systems.

RDM Devices.

Power Controls Systems.

* + - 1. Performance and Design Requirements:
         1. Let users set status monitoring triggers. Stay broad or get as detailed as necessary.
         2. Let users choose which products or product families to monitor.
         3. Determine Who Has Access: Include as many people on a plan as necessary up to 250 users per site.

Each User:

Has their own account.

Can opt in to the alerts they want to receive.

Can receive text every time a monitored action takes place.

Can get a daily, weekly, or monthly digest email of specific events.

Configurable Time of Day, Day(s) of week, and/or day(s) of month.

Display Accessibility Options: Ensure each user gets the information they need in a way they can process it.

Font selection includes dyslexic friendly font option.

Font size choices from extra small to extra large.

* + - * 1. Sign In: To ETC SiteLink, using login credentials of an ETC One account.

Keep Me Signed In Check Box: To remain signed in after closing the browser.

* + - * 1. Permissions:

View: User can view a location

Operate: User can use action buttons for a location

Administer: User can edit location and device information

No Access: User does not have access to a location

* + - * 1. User Types:

Administrator: Have access to the Site Administration settings

Users: Have access to basic settings and are restricted to the locations and permissions that are associated with individual user accounts

* + - * 1. Navigation Through the Workspace: To be intuitive. An accessible and common user interface.

Dashboard: Appears when you first log in. A quick and easy view of your home location.

Top of Dashboard: Simple gauges All Network Devices RDM Devices status in real time.

Bottom of Dashboard: Detailed list for the selected module.

Lists:

Filterable lists.

Sortable lists.

Expandable list details.

List counters.

Locations: The application can be built out to represent physical spaces on site, and group devices residing in those spaces.

Modules, subtabs, and details page, when viewed are filtered by the selected location.

Device Status: Common Status Icons: Appear across the different Modules.

Device Okay: Online and operating as expected.

Warning: Associated with a device.

Error: Associated with the device.

Status unknown due to other circumstances.

Device is offline.

Action Buttons:

Multiple Module:

Details Button: Access Details page.

Provides additional details not captured in the list.

Identify Button: Provide visual identification of device.

While the device is identifying, the button is blue.

Delete Button: Remove a device from the current location.

Do not remove the device from the system.

Deleted device appears in Unbound Devices when not assigned to any location.

Module Specific: Detailed in the respective Module documentation.

* + - * 1. Modules:

All Network Devices: Default module when signing in or switching sites. Provides a view of networked devices in your system.

\*\* NOTE TO SPECIFIER \*\* Delete Modules below not required. This list should match the selection in ETC Product Lines above.

Paradigm: A list view of Paradigm processors bound to the current location.

Processors subtab is currently the only view available.

Consoles: A view of ETC Consoles bound to the current location.

The Eos Family subtab is currently the only view available.

Mosaic: A view of Mosaic system components.

Subtabs: Projects, Controllers, and Devices.

Rigging: Provides detailed information about the status of Rigging controllers and hoists in the currently selected location.

Each Rigging Controller Row: Can be expanded to show the hoists connected.

Each Hoist Row: Can be expanded to show more in-depth details about the hoist status and position.

RDM Devices: Provides a view of RDM devices bound to the current location.

Each Device Row: Can be expanded to show more details about the device status and properties.

Power Controls: Provides a view of the ETC power controllers bound to the currently selected location.

Echo Subtab: Provides data about Echo power controllers bound to current location.

Each Row: Can be expanded to show more details about the device status and any current errors.

Sensor Subtab: Provides data about Sensor power controllers bound to the current location.

Each Row: Can be expanded to show more details about the device status and current errors.

\*\* NOTE TO SPECIFIER \*\* Gateways and sACN Viewer Modules are included with plan levels Solo, Trio, and Ultra.

Gateways: A view of ETC DMX Gateways bound to the current location.

DMX Gateways subtab is currently the only view available.

sACN Viewer: Provides a view of sACN levels on the ETC control network.

Can help troubleshoot why fixtures or devices exhibit specific behavior.

* + - 1. Site Administration Settings:
         1. Locations and Permissions: Create and organize site locations and gives you an editor for setting location permissions.
         2. Alert Management: Manage alert rules. Create, duplicate, delete rules. Can detail by location(s), device(s), device type(s), error type(s), error(s), unique identifier(s). Can determine length of time state must exist before sending notification(s).
         3. Site Management: Adjust site information and assign user roles for any user existing accounts.
         4. Unbound Devices: Shows unbound devices in your system and gives you the ability to resolve them.
         5. SiteBox Provisioning: Allows linking of ETC SiteBox(es).
      2. System Requirements:
         1. ETC SiteBox Hardware network connections:

Lighting and/or Rigging network.

The internet. As provided through existing IT infrastructure.

* + - * 1. Once Connected: Network devices are automatically discovered and can be bound to locations.
        2. Viewing ETC SiteLink: Via desktop computer, laptop, tablet, or phone running a compatible internet browser.
      1. ETC SiteBox:
         1. Technical Requirements: For connection to ETC SiteLink.

Requires an internet connection to communicate with ETC SiteLink.

Terminating a Cat5e/Cat6/Cat6a port near the ETC SiteBox connecting to the network with Internet access.

\*\* NOTE TO SPECIFIER \*\* Delete 1 or 0 Internet Connection options not desired.

Internet Connection: Full-duplex wired 10/100/1000BASE-T RJ45 connector.

Internet Connection: An 802.11ax Wi-Fi 6 interface for Internet connectivity.

Upload and Download: May require 40 Mbps for consistent performance.

Bandwidth beneath this threshold may result in a degraded user experience.

ETC Control System Connection:

A full-duplex wired 10/100BASE-T Wired RJ45 connector for the ETC Control Network, Lighting and/or Rigging.

Terminate a network port near the ETC SiteBox using Cat5e/Cat6/Cat6a cable connecting to ETC Control Network.

Firewall and Network Configuration:

All connections via the Internet Access network are initiated by ETC SiteBox. This port should be within standard IT best practice security boundaries for a corporate intranet device.

Communications on the ETC Control Network: May be initiated by ETC SiteBox or by other control products. In typical usage, this network would not be firewalled or routed between ETC SiteBox and the other control products.

The two networks are not expected to allow intercommunication or routing.

ETC SiteBox traffic is distinct between the two interfaces; the two networks carry different traffic and are not bridged.

Ports and Protocols:

ETC SiteBox initiates communication to ETC SiteLink and time servers over the Internet Access network.

NTP communication occurs via UDP packets. Stateful firewall rules must permit related and established incoming communication to UDP port 123 as well as outgoing.

Port Destination: 443.

Hosts: \*.etcsitelink.io.

Use: TCP - HTTPS SiteLink communications.

Port Destination: 123.

Hosts: \*.nist.gov / \*.pool.ntp.org

Use: UDP - NTP time synchronization.

ETC Control System Connection:

Uses a variety of ports and protocols to communicate with other products on the ETC Control Network. If the ETC Control Network is also managed, please contact ETC Technical Services for assistance in identifying the ports and protocols used in your system.

Mounting:

Surface: Attach the ETC SiteLink mounting bracket to the ETC SiteLink using provided mounting bracket screws.

ETC Mounting Bracket: Provides a variety of mounting holes for you to use depending on your situation.

DIN-Rail Mounting: The DIN-mount bracket mounts to the ETC SiteLink mounting bracket using provided screws.

Attach the ETC SiteLink mounting bracket to the ETC SiteLink using provided screws.

Equipment Rack Rail Mounting: Attach the ETC SiteLink mounting bracket to the ETC SiteLink using provided mounting bracket screws.

ETC Mounting Bracket: Provides equipment rack rail unit (1 RU) spaced holes for attachment to equipment railing.

* + - * 1. ETC SiteBox Hardware:

Power button

Factory reset button.

USB Micro B port, for connection to computer.

Coaxial connections for antennae (x2).

Power (12V) receptacle.

Ethernet port 1.

Ethernet port 2.

Cables or Connectors to configure ETC SiteBox with ETC SiteLink:

12 V power supply, provided, to connect to the power receptacle.

USB Micro B to USB A cable, provided, to connect the Console USB Micro B port to a computer for initial configuration.

An Ethernet cable, not provided, to connect the Ethernet port 1 to Internet network.

An Ethernet cable, not provided, to connect the Ethernet port 2 to lighting/rigging network.

* + - * 1. ETC SiteBox Electrical:

Power Input: 12 VDC.

120-240 VAC 50/60Hz AC-DC adapter with international connector options, provided.

36 watt current draw.

* + - * 1. ETC SiteBox Environmental:

Ambient Operating Temperature: 32 to 140 degrees F (0 to 60 degrees C).

Operating Humidity: 10 percent to 90 percent non-condensing.

Storage Temperature: - 40 to 185 degrees F (-40 to 85 degrees C).

Fanless design.

* + - * 1. ETC SiteBox Standards Compliance: CE Compliant, FCC, EN 55032/5, EN61000-6-2, EN 61000-6-3, EN/UL/IEC 62368-1.

\*\* NOTE TO SPECIFIER \*\* The Simple Network Boxes provide a solution for systems with a limited number of network devices without the requirements of a full equipment rack. Small networked systems, basic systems requiring Power over Ethernet (PoE), or isolated devices requiring fiber interconnection. Delete paragraph if not required or delete model not required.

* + 1. Network Boxes:
       1. Basis of Design: Simple Network Boxes (SNB) as, manufactured by ETC Inc. Provides Ethernet connectivity for small systems requiring basic network connectivity between system devices. Combines an 8 or 16 port network switch with a patch panel and isolated fiber termination area in a convenient surface-mount installation.
       2. Model SNB8FP: 8-Port Simple Network Box with PoE and Fiber Input Option.
          1. Dimensions (HxWxD): 20 x 14 x 6 inches (508 x 356 x 152 mm).
          2. Weight: 20.9 lbs (9.5 kg).
       3. Model SNB16FP 16-Port Simple Network Box with PoE and Fiber Input Option.
          1. Dimensions (HxWxD): 20 x 14 x 6 inches (508 x 356 x 152 mm).
          2. Weight: 21.5 lbs (9.8 kg).
       4. UTP terminations using integrated patch panels and connectors.
       5. Isolated fiber termination area with dedicated space for service loop
       6. Standards Compliance:
          1. ETL Listed.
          2. IEEE 802.3 Ethernet.
          3. IEEE 802.3af Power over Ethernet (PoE).
          4. IEEE 802.1AB Link Layer Discovery Protocol (LLDP).
          5. IEEE 802.1Q VLAN Support.
          6. IEEE 802.1w Rapid Spanning Tree Protocol (RSTP).
          7. IETF RFC 2236 Internet Group Management Protocol, version 2 (IGMPv2).
       7. Enclosure: Fully enclosed surface-mount box. Cover: Keyed and removable.
          1. Material: 16-gauge steel construction.
          2. Finish: Black fine-textured power coat paint.
          3. Conduit Knockouts: All four sides. None on front cover or back.
          4. Isolated fiber termination area.
       8. Electrical: Power Feed Required: 120 VAC, 20 A maximum.
          1. Switch Power Supply: 92 W. Fully integrated within enclosure. 82 W available for PoE devices.

\*\* NOTE TO SPECIFIER \*\* Delete port count option not required.

* + - * 1. Port Count: 8-port switch supplied with enclosure.
        2. Port Count: 16-port switch supplied with enclosure. PoE available on first 12 ports.
        3. Includes UTP termination panel and patch cables.

\*\* NOTE TO SPECIFIER \*\* Termination kits are optional. Delete termination kit not required.

* + - * 1. Fiber Connections: Supports up to 2 connections with fiber termination kits. A Fiber Termination Kit is required for each fiber port; a maximum 2 per Simple Network Box.

Short Haul Fiber Termination Kit: Model SNBFP-SHK for the Simple Network Boxes specified. Supports 850 nm multi-mode fiber.

Maximum Distance: 1804 ft (550 meters).

Long Haul Fiber Termination Kit: Model SNBFP-LHK for the Simple Network Boxes specified. Supports 1310 nm single-mode fiber.

Maximum Distance: 6.2 miles. (10 kilometers).

* + 1. Product: Concert Configuration Software by ETC Inc. For ETC Net3 and RDM capable devices. Easy-to-use interface for simple and advanced configuration of lighting control systems from a single application.
       1. Individual Device Configurations: Retrieves, saves, and uploads them to the system or an individual device at any time.
       2. Features:
          1. Real time build and edit system configurations when connected to lighting system.
          2. Edit existing or new configurations off-line. Upload them to system at any time.
          3. Save default configurations for an entire lighting system to reset your system to its default state.
          4. Error reporting from any ETC Net3 or RDM device.
          5. Configure any RDM device connected to an ETC Gateway.
       3. Environment:
          1. Clipboard functionality for entire objects, settings, and text.
          2. Undo and redo functionality.
          3. Application interface based around a tree-view, a workspace area, a property editor, and item selector.
          4. Data representation in graphical workspace (plan) or in tabular form (spreadsheet).
          5. Plan views support zoom, layout, and snap-to-grid functionality.
          6. Property inspector displays and allows properties modification for single or multiple objects.
       4. System Configuration:
          1. Add devices by selection from a library or by automatic discovery.
          2. Topographical Network Map created by automatic discovery of online devices.
          3. View devices making up a system network in a World View or create Logical Systems to contain a subset of devices.
          4. Configuration mini editor to be displayed for any device.
          5. Arrange items displayed on the plan using drag-and-drop interaction.
          6. Import images as backgrounds for the plan view.
          7. Create logical DMX and Ethernet connections between devices.
          8. Discover and configure devices with incorrect network setting using the Unreachable Devices Wizard.
       5. Computer Requirements:
          1. PC: Windows 7/8/10 or later; any full version.

Processor: 2 GHz, Dual or quad core recommended.

RAM: 1 GB. 2 GB or more recommended.

Screen Resolution: 1280 x 1024 or higher.

Support for OpenGL.

Ethernet port.

Keyboard, mouse, monitor, and USB port to use Gadget for RDM device configuration.

* + - * 1. Mac: OS X Mojave Version 10.14.3 or later.

Multi-Core Processor: 2.0 GHz or higher.

RAM: 512 MB minimum.

Screen Resolution: 1280 x 1024 or higher.

Ethernet port.

Keyboard, mouse, monitor, and USB port to use Gadget for RDM device configuration.

* + 1. Product: Integrated Systems Series ETCpad by ETC inc. Accessory for ETC lighting systems. Apps are loaded and updated via ETC's update utility software. Multiple units can be used to configure and control connected systems.
       1. Data Connections: Wireless and Built-in RJ45 connector, for direct network communication.
       2. Power Consumption: Approximately 3 A at 5 V or 2 A at 9 V.
       3. Ambient Room Temperature: 14 to 122 degrees F (-10 to 50 degrees C).
       4. Regulatory Compliance: CE compliant, cULus listed, FCC compliant, RoHS compliant, and WEEE. IP-65 rated enclosure.
       5. Hardware and Interfaces:
          1. Ruggedized exterior with rubber edges for use in demanding environments.
          2. Embedded Android environment, locked down to only launch supported mobile applications, no store account needed.
          3. Full HD display: 8 inch with scratch-resistant glass and multi-touch control.
          4. Rechargeable lithium-ion battery (3.8 V, 4900 mAh, 18.62 Wh). Up to 12 hours of operation under normal conditions.
          5. One 802.11ac Wi-Fi Ethernet adapter.
          6. Bluetooth 5.0 for connecting with supported products.
          7. Removable wired network adapter plate, with hand-grip. One configurable Gigabit Ethernet port (RJ45 connector), management clip for cable up to 6 mm in diameter.
          8. One USB-C 3.1 port, for charging and applying updates.
          9. One Micro SD slot, for applying updates.
          10. One POGO expansion connector, for use with available docks and chargers.
          11. Power switch.
          12. Power/battery status indicator.
       6. Supported Mobile Applications and Compatibility:
          1. Eos Focus Remote works with Eos Family entertainment controllers including Eos Ti, Gio, Gio @5, Ion Xe 20, Ion Xe, Element 2, Eos RPU3, Ion Xe RPU, ETCnomad and Eos for Windows/macOS.
          2. EchoAccess works with Echo architectural control systems that include an Echo Expansion Bridge.
          3. Paradigm Touchscreen Remote works with Paradigm architectural control Systems that include 7 inch touchscreens.
          4. Paradigm Mobile Button Station works with Paradigm architectural control systems.
          5. MyETC: Photometrics app containing useful data on ETC luminaires.
          6. Sensor3 TPSR works with Sensor3 power control systems.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required or delete products not required.

* 1. ENTERTAINMENT CONTROLS (RESPONSE)

\*\* NOTE TO SPECIFIER \*\* Lighting control gateway; microprocessor-based providing 0 to 10 V control for lighting systems. Permit DMX-512 and Ethernet Data to be received and converted to 0 to 10V control outputs.

* + 1. Product: Response 0 to 10V Gateway by ETC, Inc.
       1. Model RSN-LV: Response 0 to 10 V Gateway.
       2. Standards Compliance: cETLus Listed. CE compliant. EAC certified. RoHS compliant. WEEE. UL 924 LISTED for emergency lighting applications.
       3. Functional:
          1. Supports sACN control input per ANSI E1.31.
          2. Supports USITT DMX512-A control input per ANSI E1.11.
          3. Supports 0 to 10 V sink control per IEC60929 Annex E.
          4. Supports per-addressor per-universe-level priority.
          5. Configurable dimming curve per channel.

Linear.

Mod-Square.

Custom.

* + - 1. Mechanical:
         1. Intuitive four-button interface.
         2. Onboard display for identification, status, and configuration.
         3. Enclosure: Extruded aluminum.
         4. Network and power activity indicators.

Blue power indicator.

Green and orange network activity indicator.

* + - * 1. Female RJ45 for connection to lighting network.
        2. Pluggable terminals provided for all wiring connections.
        3. Selection switch for emergency input configuration.

Normally Open, Normally Closed or Off.

* + - * 1. Ten unit DIN enclosure.
        2. Mounting complies with DIN43880 (35/7.5 rail).
      1. Electrical:
         1. Compliant with IEEE 802.3i for 10BASE-T, 802.3u for 100BASE-TX.
         2. 18 to 24 VDC power input using two-pin pluggable connection.
         3. Maximum 18 W current draw at 18 to 24 V.
         4. Twenty-four 0 to 10 V outputs, each supporting voltage sink connections, 100 mA maximum current per output.
      2. DMX Input Port:
         1. Optically isolated input from the Gateway electronics.
         2. Withstands fault voltages of up to 250 VAC.
         3. Integrated DMX/RDM termination.
      3. Configuration:
         1. Onboard configuration using intuitive four-button interface.
         2. Configuration provided using Concert software.
         3. Configurable starting address.
         4. Up to four sources may be combined to the network with each source or address allowed an independent priority.
      4. Ambient Operating Temperature: 32 to 104 degrees F (0 to 40 degrees C).
      5. Operating Humidity: 5 to 95 percent non-condensing.
      6. Storage Temperature: -40 to 158 degrees F (-40 to 70 degrees C).
    1. Product: Response Analog IO Gateway by ETC, Inc.
       1. Model RSN-IO-DIN: Response Analog IO Gateway.
       2. Standards Compliance: cETLus Listed. CE compliant. RoHS compliant. WEEE.
       3. Functional:
          1. Integrates with Eos, Paradigm, Mosaic and third party systems.
          2. Twelve Analog Inputs, Contact Closure or 0 to 10 V, Capable of Triggering:

ACN messages including contact state or analog control.

User defined UDP messages on change from high to low, or low to high, of a 0 to 10 V input.

sACN level controlled mapped from a 0 to 10 V input.

* + - * 1. Twelve Low Voltage Relay Outputs Controlled By:

ACN messages.

UDP messages.

sACN levels.

* + - * 1. Parameter configuration of each input and output via Concert software.
        2. On board screen displays status of all inputs and outputs.
        3. Supports connection of multiple gateways for integration network tunneling without the need for an additional controller.
      1. Mechanical:
         1. Intuitive four-button interface.
         2. Onboard display for identification, status, and configuration.
         3. Enclosure: Molded plastic.
         4. Network and power activity indicators.

Blue power indicator.

Green and orange network activity indicator.

* + - * 1. Female RJ45 for connection to lighting network.
        2. Pluggable terminals provided for all wiring connections.
        3. Nine unit DIN enclosure.
        4. Mounting complies with DIN43880 (35/7.5 rail).
      1. Electrical:
         1. Compliant with IEEE 802.3i for 10BASE-T, 802.3u for 100BASE-TX.
         2. Powered using 802.3af for Power over Ethernet.

\*\* NOTE TO SPECIFIER \*\* Item below is optional. Delete if not required.

12-24 VDC power input for use with non-PoE systems.

* + - 1. Analog Inputs:
         1. Two pluggable rising clamp screw terminal connectors with 6 analog inputs per terminal.

Terminal connectors support in and common per input.

Analog inputs can sense between 0 to 10 V (10 V, 100 mA per gateway utility supply provided).

Wet or dry contact closure per input.

* + - 1. Contact Outputs:
         1. Three pluggable rising clamp screw terminal connectors with 4 relay outputs per terminal.

Normally open "N.O." normally closed "N.C." and common "COM" connectors.

Each output is rated for 0.5 A at 30 VDC/VAC.

* + - * 1. Pilot duty rated.
        2. Single-pole double-throw relays.
      1. Operating Temperature Range: 32 to 104 degrees F (0 to 50 degrees C).
      2. Relevant Humidity Non-Condensing: 5 to 95 percent.
    1. Product: Response SnapBack by ETC Inc.
       1. Model RSN-SB-DIN: Response SnapBack; DIN rail mounted.
       2. Model RSN-SB-RM: Response SnapBack; portable.
       3. Standards Compliance: cETLus Listed, CE Compliant, RoHS Compliant, and WEEE
       4. Functional:
          1. Integrates with Eos, Paradigm, Mosaic, and Echo systems using UDP triggering.

Eos, Paradigm, and Mosaic systems can support up to 50 SnapBacks in a single system.

Echo systems can support up to two SnapBacks on a single EchoTouch or Echo Integration Interface with each assigned to a single Echo space.

* + - * 1. Integrates with Echoflex systems using analog inputs.
        2. 12 analog inputs capable of triggering preset playback and off.

Inputs 1-10 trigger preset playback.

Input 11 is reserved for future development.

Input 12 triggers the Off state.

* + - * 1. UDP triggering supports up to two subscribers as well as "Subcribers-only" triggering for security.
        2. Supported UDP triggering includes:

Preset playback, with custom timing.

Off state, with custom timing.

Preset record.

Preset status.

Contact resync.

Help.

* + - * 1. On board screen displays current preset status and record options.
        2. Supports local device configuration or advance configuration with ETC Concert software.
      1. Mechanical:
         1. Intuitive four-button interface.
         2. Onboard display for identification, status, and configuration.
         3. Molded plastic enclosure.
         4. Network and power activity indicators.

Blue power indicator.

Green network activity indicator.

* + - * 1. RJ45 socket for connection to lighting network.
        2. Pluggable terminals provided for all wiring connections.
        3. 9 standard unit DIN enclosure.
        4. Mounting complies with DIN 43880 (35/7.5 rail).
      1. Electrical:
         1. Compliant with IEEE 802.3i for 10BASE-T, 802.3u for 100BASE-TX.
         2. Powered using 802.3af for Power over Ethernet.

\*\* NOTE TO SPECIFIER \*\* Power unit below is optional. Delete if not required.

Power Unit: 12-24 VDC for use with non-PoE systems.

* + - 1. Analog Inputs:
         1. Two pluggable rising clamp screw terminal connectors with six analog inputs per terminal.

Terminal connectors support in and common per input.

Analog inputs support contact closures for preset triggering.

Wet or dry contact closure per input.

* + - 1. Ambient temperature: 32 to 104 degrees F (0 to 40 degrees C).
      2. Ambient humidity: 5 to 95 percent non-condensing.
    1. Product: Response DALI Gateway by ETC, Inc.
       1. Model RSN-DALI: Response DALI Gateway.
       2. Standards Compliance: cETLus Listed. CE compliant. RoHS compliant. WEEE.
       3. Functional:
          1. Supports USITT DMX512-A control input per ANSI E1.11.
          2. Supports DALI loop control for one DALI loop.
          3. Algorithmic dimming conversion to ensure fade performance.
          4. Supports failed device replacement without the need for software or configuration.
       4. Mechanical:
          1. Onboard display for identification, status, and configuration.
          2. Extruded aluminum enclosure.
          3. DMX and DALI activity indicators.
          4. Plug-able terminals provided for all wiring connections.
          5. 8 unit DIN enclosure.
          6. Mounting complies with DIN43880 (35/7.5 rail).
       5. Electrical:
          1. 12 to 24 VDC power input using three-pin plug-able connection.
          2. One DALI loop output. Requires external DALI power supply.
       6. DMX Input Port:
          1. Optically isolated input from the Gateway electronics.
          2. Withstands fault voltages of up to 250 VAC.
          3. Integrated DMX/RDM termination.
       7. Configuration:
          1. Configured via RDM.
          2. Configuration provided using Concert software connected to an ETC DMX gateway, or third party configuration software.
          3. Configurable starting address with support for custom patch tables allowing non-sequential addressing.
       8. Operating Temperature Range: 32 to 104 degrees F (0 to 50 degrees C).
       9. Relevant Humidity Non-Condensing: 5 to 95 percent.
       10. Storage Temperature Range: -40 to 158 degrees F (-40 to 70 degrees C).

\*\* NOTE TO SPECIFIER \*\* DIN Gateway provides data distribution using the quality and reliability of ETC's network technology. Built for Net3 using industry-standard sACN, DMX and RDM.

* + 1. Product: Response Mk2 DIN Gateways by ETC Inc.

\*\* NOTE TO SPECIFIER \*\* Delete model options not required.

* + - 1. Model: RSN-DMX1-DIN Response MK2 1-port Gateway DIN Rail.
      2. Model: RSN-DMX2-DIN Response MK2 2-port Gateway DIN Rail.
      3. Model: RSN-DMX4-DIN Response MK2 4-port Gateway DIN Rail.
      4. Standards Compliance: cETLus Listed, CE compliant, EAC certified, RoHS compliant, and WEEE.
      5. Functional:
         1. Supports Net3/ACN (ANSI E1.31 and E1.17), RDM (ANSI E1.20), and USITT DMX512-A per ANSI E1.11.
         2. Compliance: USITT DMX512 and ANSI E1.11 DMX512-A.
         3. Flexible Output Patch: Allows a 512 address universe to begin at any output address.
         4. Advanced Input Patch.
         5. Support for per-addressor per-universe-level priority.
         6. Delay Time from Input to Output: Not greater than one packet time.
         7. Selectable DMX Refresh Rate: Maximum of 40 Hz.
         8. Supports 255 total RDM devices.
      6. Mechanical:
         1. Intuitive four-button interface.
         2. Onboard display for identification, status, and configuration.
         3. Enclosure: Molded plastic.
         4. Mounting: Complies with DIN43880 (35/7.5 rail).
         5. DIN installation enclosure available.
         6. Network, power, and data activity LED indicators.

Blue power indicator, green network activity indicator.

Bi-color DMX activity indicator.

* + - * 1. RJ45 connector for connection to lighting network.
        2. Reset button for hard reset or forced reboot.
      1. Environmental:
         1. Ambient Operating Temperature: 32 to 104 degrees F (0 to 40 degrees C).
         2. Operating Humidity: 5 to 95 percent non-condensing.
         3. Storage Temperature: -40 to 158 degrees F (-40 to 70 degrees C).
      2. Electrical:
         1. Compliant with IEEE 802.3i for 10BASE-T, 802.3u for 100BASE-TX and 802.3af for Power over Ethernet.
         2. Power Input: 12 to 24 VDC for use with non-PoE systems.
         3. Maximum seven watt current draw.
         4. Pluggable clamp style terminals for solid and stranded cable provided.
      3. Configuration:
         1. Local configuration options.
         2. Remote configuration by Concert.

Supports 512 DMX addresses per port.

Supports 63,999 Streaming ACN universes.

* + - * 1. DMX data input or output configurable by user.
        2. Multiple sources may be combined to the network with each source or address allowed an independent priority.
        3. Individual port start address and offset.
        4. User-configurable labeling.

\*\* NOTE TO SPECIFIER \*\* Four-Port Gateway provides data distribution using the quality and reliability of ETC's network technology. Built for Net3 using industry-standard sACN, DMX and RDM.

* + 1. Product: Response Mk2 Four-Port Gateway by ETC Inc.

\*\* NOTE TO SPECIFIER \*\* Delete model options not required.

* + - 1. Model: RSN-DMX4-O Response Mk2 4-Port Gateway 4 Output.
      2. Model: RSN-DMX4-I Response Mk2 4-Port Gateway 4 Input.
      3. Model: RSN-DMX4-3O1I Response Mk2 4-Port Gateway 1 In 3 Out.
      4. Model: RSN-DMX4-T Response Mk2 4-Port Gateway 4 Terminal.
      5. Model: RSN-DMX4-R Response Mk2 4-Port Gateway 4 RJ45.
      6. Standards Compliance: cETLus Listed, CE compliant, EAC certified, RoHS compliant, and WEEE.
      7. Functional:
         1. Supports Net3/ACN per ANSI E1.31 and E1.17, RDM (ANSI E1.20), and Supports USITT DMX512-A per ANSI E1.11.
         2. Compliance: USITT DMX512 and ANSI E1.11 DMX512-A.
         3. Flexible Output Patch: Allows a 512-address universe to begin at any output address.
         4. Advanced Input Patch.
         5. Support for per-addressor per-universe-level priority.
         6. Delay Time: From input to output not greater than one packet time.
         7. Selectable DMX refresh rate: Maximum of 40 Hz.
         8. Supports 255 total RDM devices.
      8. Mechanical:
         1. Intuitive four-button interface.
         2. Onboard display for identification, status, and configuration.
         3. Fabricated from 16-gauge cold-rolled steel.
         4. Finish: Black, Fine-textured, powder-coat.
         5. C-clamp and U-bolt hardware available.
         6. Half 19 inch equipment rack width allows eight DMX ports in 1U height.
         7. Network, power, and data activity LED indicators.

Blue power indicator, green network activity indicator.

Bi-color DMX activity indicator.

* + - * 1. Repositionable RJ45 connector for connection to lighting network.
        2. Reset button for hard reset or forced reboot.
      1. Environmental:
         1. Ambient Operating Temperature: 32 to 104 degrees F (0 to 40 degrees C).
         2. Operating Humidity: 95 percent non-condensing.
         3. Storage temperature: -40 to 158 degrees F (-40 to 70 degrees C).
      2. Electrical:
         1. Compliant with IEEE 802.3i for 10BASE-T, 802.3u for 100BASE-TX and 802.3af for Power over Ethernet.
         2. Power Input: 12 to 24 VDC for use with non-PoE systems.
         3. Maximum seven watt current draw.
         4. Pluggable clamp style terminals for solid and stranded cable provided for terminal version
      3. Configuration:
         1. Local configuration options.
         2. Remote configuration by Concert.

Supports 512 DMX addresses per port.

Supports 63,999 Streaming ACN universes.

* + - * 1. DMX data input or output configurable by user.
        2. Multiple sources may be combined to the network with each source or address allowed an independent priority.
        3. Individual port start address and offset.
        4. User-configurable labeling.
    1. Product: Response Mk2 One-Port Gateway by ETC Inc.
       1. Standards Compliance: cETLus Listed, CE compliant, EAC certified, RoHS compliant, and WEEE.

\*\* NOTE TO SPECIFIER \*\* Delete gateway option and model option not required.

* + - 1. One-Port Gateways: Wall-Mount.
         1. Model: RSN-DMX1-O: Wall-mount 1-port Gateway. 1 Output.
         2. Model: RSN-DMX1-I: Wall-mount 1-port Gateway. 1 Input.
      2. One-Port Gateways: Portable.
         1. Model: RSN-DMX1-O-P: Portable 1-port Gateway. 1 Output.
         2. Model: RSN-DMX1-I-P: Portable 1-port Gateway. 1 Input.
      3. Color: As determined by the Architect from the Manufacturer's offering.
      4. Functional:
         1. Supports Net3/ACN per ANSI E1.31 and E1.17, RDM per ANSI E1.20, and USITT DMX512-A per ANSI E1.11.
         2. Compliance: USITT DMX512 and ANSI E1.11 DMX512-A.
         3. Flexible Output Patch allows a 512-address universe to begin at any output address.
         4. Advanced Input Patch.
         5. Support for per-addressor per-universe-level priority.
         6. Maximum delay time from input to output not greater than one packet time.
         7. Selectable DMX refresh rate: At least 40 Hz.
         8. Supports 255 total RDM devices.
      5. Mechanical:
         1. Intuitive four-button interface,
         2. Onboard display for identification, status, and configuration.
         3. Enclosed electronics assembly and faceplate.
         4. No visible means of attachment.
         5. Flush-mount in industry standard backbox, RACO 690 or equivalent. Surface-mount backboxes available.
         6. Construction: Injection-molded, ABS plastic.
         7. Green LED: For network activity indication.
         8. RJ45 connector for connection to lighting network.
         9. Reset button: For hard reset or forced reboot.
      6. Environmental:
         1. Ambient Operating Temperature: 32 to 104 degrees F (0 to 40 degrees C).
         2. Operating Humidity: 95 percent non-condensing.
         3. Storage temperature: -40 to 158 degrees F (-40 to 70 degrees C).
      7. Electrical:
         1. Compliant with IEEE 802.3i for 10BASE-T, 802.3u for 100BASE-TX and 802.3af for Power over Ethernet.
         2. Power Input: 12-24 VDC for use with non-PoE systems.
         3. Maximum Current Draw: 4 W.
      8. Configuration:
         1. Local configuration options.
         2. Remote configuration by Concert.

Supports 512 DMX addresses per port.

Supports 63,999 Streaming ACN universes.

* + - * 1. DMX data input or output configurable by user.
        2. Multiple sources may be combined to the network with each source or address allowed an independent priority.
        3. Individual port start address and offset.
        4. User-configurable labeling.
    1. Product: Response Mk2 Two-Port Gateway by ETC Inc.
       1. Standards Compliance: cETLus Listed, CE compliant, EAC certified, RoHS compliant, and WEEE.

\*\* NOTE TO SPECIFIER \*\* Delete gateway and model options not required.

* + - 1. Two-Port Gateways: Wall-Mount.
         1. Model: RSN-DMX2-O. Wall-mount 2-port Gateway. 2 Output.
         2. Model: RSN-DMX2-I. Wall-mount 2-port Gateway. 2 Input.
      2. Two-Port Gateways: Portable.
         1. Model: RSN-DMX2-O-P. Portable 2-port Gateway. 2 Output.
         2. Model: RSN-DMX2-I-P. Portable 2-port Gateway. 2 Input.
      3. Color: As determined by the Architect from the Manufacturer's offering.
      4. Functional:
         1. Supports Net3/ACN per ANSI E1.31 and E1.17, RDM per ANSI E1.20, USITT DMX512-A per ANSI E1.11.
         2. Compliance: USITT DMX512 and ANSI E1.11 DMX512-A.
         3. Flexible Output Patch allows a 512-address universe to begin at any output address.
         4. Advanced Input Patch.
         5. Support for per-addressor per-universe-level priority.
         6. Maximum delay time from input to output not greater than one packet time.
         7. Selectable DMX refresh rate with a maximum at least 40 Hz.
         8. Supports up to 255 total RDM devices.
      5. Mechanical:
         1. Intuitive four-button interface.
         2. Onboard display for identification, status, and configuration.
         3. Enclosed electronics assembly and faceplate.
         4. No visible means of attachment.
         5. Flush-mount in industry standard backbox, RACO 690 or equivalent. Surface-mount backboxes available.
         6. Construction: Injection-molded, ABS plastic.
         7. Network and power activity LED indicators.

Blue power indicator, green network activity indicator.

RJ45 connector for connection to lighting network.

* + - * 1. Reset button: For hard reset or forced reboot.
      1. Environmental:
         1. Ambient Operating Temperature: 32 to 104 degrees F (0 to 40 degrees C).
         2. Operating Humidity: 95 percent non-condensing.
         3. Storage temperature: -40 to 158 degrees F (-40 to 70 degrees C).
      2. Electrical:
         1. Compliant with IEEE 802.3i for 10BASE-T, 802.3u for 100BASE-TX and 802.3af for Power over Ethernet.
         2. Power Input: 12 to 24 VDC for use with non-PoE systems.
         3. Current Draw: Maximum 4 W.
      3. Configuration:
         1. Local configuration options.
         2. Remote configuration by Concert.

Supports 512 DMX addresses per port.

Supports 63,999 Streaming ACN universes.

* + - * 1. DMX data input or output configurable by user.
        2. Multiple sources may be combined to the network with each source or address allowed an independent priority.
        3. Individual port start address and offset.
        4. User-configurable labeling.
    1. Product: Response Opto-Splitter by ETC Inc. Provides quality and reliable DMX data distribution using industry-standard DMX and RDM.

\*\* NOTE TO SPECIFIER \*\* Delete model options not required.

* + - 1. Model: RSN-OPTO-12O. 12 Port Rackmount XLR.
      2. Model: RSN-OPTO-16R. 16 Port Rackmount RJ45.
      3. Model: RSN-OPTO-16T. 16 Port Rackmount Terminal.
      4. Model: RSN-OPTO-8DIN. 8 Port DIN rail Terminal.
      5. Model: RSN-OPTO-DBOX. 16 Output DIN box dual 8 Opto.
      6. Model: RSN-OPTO-BOX. 8 Output -DIN box single 8 Opto.
      7. Model: RSN-OPTO-DBOX-E. 16 Output -DIN box dual 8 Opto; Emergency.
      8. Model: RSN-OPTO-BOX-E. 8 Output -DIN box single 8 Opto; Emergency.
      9. Standards Compliance: cETLus Listed, CE compliant, EAC certified, RoHS compliant, and WEEE.
      10. Functional:
          1. No configuration required.
          2. Supports DMX512, DMX512 (1990), DMX512-A, ANSI E1.20 Remote Device Management (RDM).
          3. Supports 256 total RDM devices.
      11. Mechanical:
          1. Rack-mount form factor:

Aluminum fabrication.

Fine-textured, powder-coat finish. Color: Black.

Equipment Rack Width: Full 19 inch.

Mounting: Front or rear facing.

* + - * 1. DIN rail form factor:

Enclosure: Molded plastic.

Mounting: Complies with DIN43880 (35/7.5 rail).

Unit is 9 DIN units wide.

DIN installation enclosure available.

* + - * 1. Power and Data Activity LED Indicators: Power: Blue. DMX activity: Green.
      1. Environmental:
         1. Ambient Operating Temperature: 32 to 104 degrees F (0 to 40 degrees C).
         2. Operating Humidity: 5 to 95 percent non-condensing.
         3. Storage temperature: -40 to 158 degrees F (-40 to 70 degrees C).
      2. Electrical:
         1. Supports DMX input and DMX thru.
         2. Provides optically isolated DMX/RDM outputs.
         3. Rack-Mount Form Factor:

Power Unit: 100 to 240 VAC 50/60 Hz.

User configurable front or rear IEC C13 power connector position.

Power Draw: 35 W max.

XLR, RJ45 and Terminal connector options.

* + - * 1. DIN Rail Form Factor:

Power Input: 12 to 48 VDC power input.

Power Draw: 8 W max.

Wiring connections use pluggable clamp style terminals for solid and stranded cable.

* + - * 1. DIN Box form factors include a suitable power supply.
    1. Product: Response Show Control Gateways by ETC Inc. A family of reliable, portable devices that can communicate with MIDI, SMPTE, Serial or other third party devices.

\*\* NOTE TO SPECIFIER \*\* Delete gateways and model options not required.

* + - 1. Response MIDI Gateways: Sends and receives information in all flavors of MIDI: Note, Show Control (MSC), and Time Code (MTC). Translates MIDI to and from UDP for integration with ETC and third-party products.
         1. Model: RSN-MIDI-P. Backpack Style.
         2. Model: RSN-MIDI-RM. Rack-Mount Style.
      2. Response SMPTE Gateways: Brings SMPTE LTC timecode signal to the Eos family console reliably to make sure everything stays on track. Ensures reliable bi-directional RS-232 data communication for system integration.
         1. Model: RSN-SMPTE-P. Backpack Style.
         2. Model: RSN-SMPTE-RM. Rack-Mount Style.
      3. Response Analog IO Gateways: Integration aid. 12 analog inputs and 12 relay outputs, it can integrate with a large selection of devices using industry-standard protocols including UDP, ACN, and sACN. In addition to third-party integration it speaks natively to Eos consoles, Unison Paradigm, and Unison Mosaic control systems.
         1. Model: RSN-IO-DIN. DIN-Mount Style
         2. Model: RSN-IO-RM. Rack-Mount Style.
      4. Response Serial Gateways:
         1. Model: RSN-SERIAL-P. Backpack Style.
         2. Model: RSN-SERIAL-RM. Rack-Mount Style.
      5. Standards Compliance: cETLus Listed, CE compliant, EAC certified, RoHS compliant, and WEEE.
      6. Functional: MIDI.
         1. Distributes MIDI over USB or Ethernet.
         2. Supports Standard MIDI over USB device class, Net3/ACN per ANSI E1.17, and MIDI over UDP.
      7. Functional: SMPTE.
         1. Distributes SMPTE over USB or Ethernet.
         2. Supports Net3/ACN (ANSI E1.17) and SMPTE over UDP.
      8. Functional: Serial.
         1. Distributes Serial over USB or Ethernet.
         2. Supports Net3/ACN (ANSI E1.17), Serial over UDP, Standard USB Serial Port Emulation Class.
      9. Mechanical:
         1. Finish: Fine-textured, powder-coat paint with matching overlay.
         2. SMPTE: 3 Pin Female XLR Connector.
         3. MIDI: 5 Pin DIN Connector In/Out/Thru ports.
         4. Serial: 9 Pin D-sub Connector.
         5. RJ45 Port: For connection to lighting network. Configurable on rack-mount units.
         6. Type B USB Female connection.
         7. Intuitive four-button interface.
         8. Onboard display for identification, status, and configuration.
         9. Status and Activity Indicators:

Blue: Power indicator.

Green: Network activity indicator.

Red/Green: USB activity indicator.

* + - 1. Environmental:
         1. Ambient Operating Temperature: 32 to 104 degrees F (0 to 40 degrees C).
         2. Operating Humidity: 5 to 95 percent non-condensing.
      2. Electrical:
         1. MIDI, SMPTE, Serial: 5 V USB power.
         2. Analog IO: Optional 12 to 24 VDC power input for use with non-PoE systems. Maximum 7 W current draw at 12 to 24 V.
         3. RJ45 connector compliant with IEEE 802.3i for 10BASE-T, 802.3u for 100BASE-TX and 802.3af for Power over Ethernet.
      3. Analog Inputs: Analog IO only.
         1. Two pluggable rising clamp screw terminal connectors with 6 analog inputs per terminal.

Terminal Connectors: Support in and common per input.

Analog inputs can sense between 0 10 V (10 V, 100 mA per gateway utility supply provided).

Wet or dry contact closure per input.

* + - 1. Contact Outputs: Analog IO only.
         1. Three pluggable rising clamp screw terminal connectors with 4 relay outputs per terminal.

Normally open "N.O.", normally closed "N.C.", and common "COM" connectors.

Each output is rated for 0.5 A at 30 VDC/VAC.

* + - * 1. Pilot duty rated.
        2. Single-pole double-throw relays.

1. EXECUTION
   1. EXAMINATION
      1. Do not begin installation until substrates have been properly constructed and prepared.
      2. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.
   2. PREPARATION
      1. Clean surfaces thoroughly prior to installation.
      2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
   3. INSTALLATION
      1. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.
   4. FIELD QUALITY CONTROL
      1. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

\*\* NOTE TO SPECIFIER \*\* Include if manufacturer provides field quality control with onsite personnel for instruction or supervision of product installation, application, erection, or construction. Delete if not required.

* + 1. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.
  1. CLEANING AND PROTECTION
     1. Clean products in accordance with the manufacturer's recommendations.
     2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION