# SECTION 26 09 23 – LIGHTING CONTROL DEVICES

THIS SPECIFICATION WAS DESIGNED FOR CSI MASTERFORMAT 2020.

THIS DOCUMENT IS INTENDED TO BE USED WHEN SPECIFYING PATHWAY CONNECTIVITY SOLUTIONS EQUIPMENT AS A BASIS OF DESIGN.

SECTION 26 09 23 – LIGHTING CONTROL DEVICES IS USED AS A PLACEHOLDER SECTION. COORDINATION WITH OTHER CSI SECTIONS AND SUBSECTIONS IS THE RESPONSIBILTY OF THE SPECIFIER.

DO NOT ISSUE THIS DOCUMENT WITHOUT SUPPORTING SPECIFICATION SECTIONS IN FOUND DIVISIONS 00 AND 01.

THIS DOCUMENT ONLY PROVIDES PART 2 INFORMATION ON A SPECIFIC PRODUCT. DO NOT ISSUE WITHOUT A FULL PART 1 AND 3.

1. GENERAL
	1. SUMMARY
		1. Section includes:
			1. DMX512 Lighting Console
			2. DMX512 Lighting Console Operating System
2. PRODUCTS
	1. DMX512 Lighting Console
		1. General
			1. Basis of Design: Cognito2 Theatrical Console.
			2. TCP/IP enabled DMX control.
			3. Provide data to control DMX512 capable luminaires and devices.
			4. Integral programmable interface software.
			5. Variants:
				1. Starter.
				2. Pro

512.

1024.

* + 1. Mechanical
			1. Housing: Injection molded plastic case fitted with steel base pan.
			2. Mounting: Tabletop.
			3. Rackmount variant mounting:
				1. 7-unit 19-inch server rack.
				2. Two symmetrical ears with eight unthreaded holes.
				3. One ear with two unthreaded holes.
			4. Ports: Recessed 12-inches from back of device for improved strain relief.
				1. Two female gold plated 5-pin XLR jacks for DMX512.
				2. One male gold plated 5-pin XLR jack for DMX512.
				3. One power over ethernet shielded RJ45 10 BASE-T/100 BASE-TX/1000 BASE-T jack.
				4. One 24 volt 2.5-millimeter barrel jack.
				5. One 19-pin high-definition monitor output.
				6. Three female 5-pin standard DIN.
				7. One male 9-pin d-subminiature for RS232 and contact closure.
				8. Four USB 2.0 type A jacks.
			5. Detachable Accessories
				1. 2.5-millimeter barrel jack AC adapter:

Input voltage

Minimum: 90 AC.

Maximum: 264 AC.

Output voltage: 24 DC.

Output maximum milliamps: 1,000.

* + - * 1. Dust cover.
			1. Anti-theft slot for lock.
			2. Two steel U-bolts for strain relief.
			3. Earth ground terminal.
			4. One recessed mechanical momentary contact for factory default.
			5. User interface:
				1. Forty-two momentary contacts

One power.

One pin.

Twenty bump.

Two go.

Two shift.

Four tool.

Four attribute.

Four function.

Two cue and pause.

One memory black out.

One dead black out.

* + - * 1. Twenty-four 60 millimeter analog slide resistance potentiometers

Twenty memory faders.

Two playback masters.

One grand master.

One memory master.

* + - * 1. Four 360-degree incremental digital rotary encoders: Twenty-four detents.
				2. One 7-inch capacitive programmable touch screen:

Resolution width: 800 pixels.

Resolution height: 480 pixels.

Color bit depth: 24-bit.

* + 1. Electrical
			1. Powered device: 15 watts.
			2. Alternate low voltage power in:
				1. Minimum: 12 volts DC
				2. Maximum: 24 volts DC.
				3. Milliamps: 1400.
			3. Single-color integral LED status indicators:
				1. Two DMX512 output.
				2. One DMX512 input.
				3. One MIDI output.
				4. One MIDI input.
				5. One MIDI thru.
			4. Tri-colored integral LED status indicators:
				1. One power type.
				2. Forty-one momentary contact.
				3. Sixteen digital rotary encoders, four per encoder.
		2. Functional
			1. Standalone and independent operation.
			2. DMX communication.
			3. DMX512 address output maximum variants
				1. Starter: 512.
				2. Pro

512.

1024.

* + - 1. Output signals:
				1. DMX512.
			2. Pro variants input signals:
				1. DMX512.
				2. MIDI show control.
				3. MIDI timecode.
				4. Contact closure.
				5. RS-232.
			3. Pro variants output signals:
				1. MIDI show control.
				2. RS-232.
			4. TCP/IP Input and Output Protocols
				1. sACN.
				2. Pathway ssACN.
				3. Pathport.
				4. Pro variants:

Art-Net.

KiNET.

* + - 1. Momentary contacts:
				1. Power

Console off: Boot console.

Console on: Force power down after six second button press.

Tri-colored integral LED status indicator

Pulsing blue: Stand-by mode.

Solid blue: On.

* + - 1. Bi-color integral LED status indicator for Power type
				1. Amber: Transformer power supply.
				2. Red: Power over ethernet supply.
			2. Processor
				1. Central

Quantity: One.

Memory: Non-volatile flash.

Firmware updates upload

Via USB.

Via ethernet and third-party computer.

Architecture: Cortex-A9.

Speed: 1200 megahertz.

Memory:

128 kilobyte flash.

4 gigabyte SLC NAND.

64 gigabyte eMMC.

Operating system: Linux.

* + - * 1. Auxiliary

Quantity: Two.

Memory: Non-volatile flash.

Firmware updates upload

Via USB.

Via ethernet and third-party computer.

Architecture: ARM 32-bit cortex.

Speed: 24 megahertz.

Memory:

128 kilobyte flash.

8 kilobyte SRAM.

Timer:

Capacity: 16-bit.

Quantity: Twelve.

* + - 1. Networking
				1. Single-chip 10Base-T/100Base-TX/1000Base-TX physical layer.
				2. Link layer firewall port isolation.
			2. Universal serial bus hub controller
				1. Driver: 24-megahertz.
				2. Ports: USB 2.0 Specification.
				3. Power operation:

Self.

Bus.

* + - * 1. Protection: 4 kilovolts powered and unpowered.
			1. RS-232 interface
				1. Data rate: 500 kilobits per second.
				2. Voltage minimum: 3 DC.
				3. Voltage maximum: 5.5 DC.
		1. Environmental
			1. Operating temperature
				1. Minimum: 14 degrees Fahrenheit
				2. Maximum: 122 degrees Fahrenheit
			2. Operating non-condensing humidity
				1. Minimum: 5 percent
				2. Maximum: 95 percent
			3. Cooling method: Passive convection.
	1. DMX512 Lighting Console Operating System
		1. General
			1. Basis of Design: Cognito2 Operating System.
			2. Provide computational tasks for the DMX512 Lighting Console specified.
		2. Interface
			1. Natural Language Control provides consistent unit values for luminaires and devices programmed in library.
			2. USB peripheral support: Pre-installed firmware for standard human interface devices.
			3. HMDI peripheral support: High definition 1080p external monitor.
				1. Resolution width: 1920 pixels.
				2. Resolution height: 1080 pixels.
			4. Momentary contacts
				1. Power:

Single momentary press: Report show file name and display menu.

Double momentary press: Programmed power down.

* + - * 1. Pin: Hold intensity values and ignore slider input.
				2. Bump: Hold program at highest intensity for duration of button press. Configurable as toggle, timed or radio group.
				3. Go: Activate next recorded cue in sequence.
				4. Shift: Modifier key provides additional functions.

Two shifts: Return to previous display.

Shift tool: Restore attribute to default.

Shift help: Disable help mode.

Shift record: Revise active cue or memory.

Shift pin: Modify pin timing.

Shift play: Assert active cue.

Shift pause: Release active playlist.

Shift bump: Toggle bump button function.

* + - * 1. Tool: List selectable attributes.
				2. Intensity: Adjust intensity of selected luminaires.
				3. Color: Adjust color of selected luminaires.
				4. Position: Adjust position of selected luminaires.
				5. Shape: Adjust shape of selected luminaires.
				6. Pause and back

First press: Pause fading cue.

Second press: Restore previous cue.

* + - * 1. Memory black out:

First press: Override all memories to off.

Second press: Restore memories to previous state.

* + - * 1. Dead black out

First press: Override all to off.

Second press: Restore all to previous state.

* + - * 1. Release:

First press: Restore selection to previous state.

Second press: Clear selection.

Third press: Restore all to previous state.

Fourth press: Override all to off.

* + - * 1. Help:

First press: Enable help mode.

Subsequent press: Cycle through help windows.

* + - * 1. Edit:

First press: Activate edit menu.

Second press: Execute edit.

Press in Select mode initiates copy attribute function.

* + - * 1. Record:

First press: Activate record menu.

Second press: Completes Record operation.

Subsequent Go button: Appends to cue list.

Subsequent Bump button: Records memory.

* + - 1. Slide resistance potentiometers
				1. Memory fader: Adjust programmed and active memory.
				2. Playback master: Adjust programmed and active playlist.
				3. Grand master: Adjust all intensities.
				4. Memory master: Adjust all memory.
			2. Digital rotary encoders
				1. One detent: One programmed unit.
				2. Shift with one detent: Smallest increment of program.
			3. Software buttons
				1. Luminaire:

Touch to select or deselect luminaire.

Double touch to take luminaire to full intensity.

Shift Touch to select a range of luminaires.

* + - * 1. Select mode

Arrow: Change page.

Par can: Change selected luminaire.

Magnifying glass: Change quantity of luminaires displayed.

Airplane: Switch pages.

Number: Release selected luminaires.

Filter: Display luminaires per selected attribute.

Information: Expand luminaire information displayed.

* + - * 1. Control mode

Intensity: Adjust intensity of selected luminaires.

Color: Adjust color of selected luminaires.

Position: Adjust position of selected luminaires.

Shape: Adjust shape of selected luminaires.

* + - * 1. Record mode

Memory: Record memory to select slider and bump button.

Cue: Record sequential cue in playlist.

Library: Record selected attribute for luminaire application.

Group: Record selected luminaires as single entity.

* + - * 1. Play mode

Playback

Play: Advance to next sequential cue in active playlist.

Back: Restore previous cue.

Pause: Pause fading cue.

Skip back: One second fade to previous cue.

Skip forward: One second fade to next cue.

Memory: Shows banks of 20 Memories

Mixed: Move between Memories and Playlists

Schedule: Astronomical/TimeClock

* + - 1. Program astronomic timeclock functionality:
				1. Time.
				2. Days.
				3. Sunrise, Sunset with offsets.
		1. Graphical
			1. General:
				1. Show file quantity.
				2. Free disk space.
			2. Software buttons:
				1. Arrow.
				2. Par can.
				3. Magnifying glass.
				4. Airplane.
				5. Number.
				6. Filter.
				7. Information.
			3. Select task luminaire quantity display option:
				1. Ten.
				2. Twenty.
				3. Forty.
				4. Sixty.
				5. One hundred.
			4. Luminaire:
				1. Assigned number.
				2. Manufacturer.
				3. Model.
				4. Starting DMX address.
				5. Type name.
				6. Active intensity value.
				7. Active color value.
				8. Intensity status color

Red: Programmer controlled.

Yellow: Memory controlled.

Cyan: Cue controlled increase.

Green: Cue controlled decrease.

Magenta: Cue controlled without change.

* + - * 1. Attribute status color

Red: Programmer controlled.

Yellow: Memory controlled.

Blue: Cue controlled.

Magenta: Cue controlled without change.

* + - 1. Playlist:
				1. Quantity of playlists.
				2. Cue quantity.
				3. Memory quantity.
			2. Manufacturer’s user guide:
				1. Interactive table of contents.
				2. Hyperlinked text.
		1. Functional
			1. Touch activation
				1. Momentary.
				2. Momentary and held modifier key.
			2. Help system:
				1. Provide overlay text to explain functionality.
				2. Provide interactive graphical user guide.
			3. Third-party USB storage device
				1. Backup and save.
				2. Reload save state.
				3. Software updates via third-party computer.
				4. Luminaire and device library updates via third-party computer.
			4. Memory: A recorded state assigned to a slider and bump button.
			5. Playlist: A grouping of recorded cues in sequential order for use with play mode.
		2. Nonfunctional
			1. Luminaire and device library
				1. Pre-installed profile quantity: 3,722.
				2. Pre-defined parameters for luminaire and device interface.
			2. Maximum programming
				1. Channels: 680.
				2. Recorded cues: 10,001.
				3. Show files: 999.
			3. Internal timecode clock quantity: Three.
			4. Timecode clock input quantity: One.
1. EXECUTION
	1. GENERAL
		1. Install device per Pathway Connectivity Solutions, an Acuity Brands Company’s instructions.

END OF SECTION