Celco 24/48

INTRODUCTION

Congratulations on your purchase of the Celco 24/48 digital lighting console. The 24/48 controller may be operated as a 48 channel manual console, a 24 channel 2-scene manual console, a 24 channel memory console, or as a self test tool allowing the user to test all faders, switches, indicators, and the liquid crystal display.

The most powerful features are available in the 24-channel memory mode, which has 180 cue memories, 48 scenemaster memories, and 8 programmable chase memories. Cue playback is via the "GO" button with adjustable timed transitions between cues controlled live from the cue transition rate fader. In addition, there are 24 pile on scenemaster faders for live touch up of scenes and cues, a manual proportional fader, and a soft patch for up to 120 dimmers of DMX512 address.

GENERAL OPERATION

START UP SCREEN - The first screen shown as the 24/48 powers up shows copyright information and firmware version number for 4 seconds. **See Figure 1.** Please refer to the firmware version number when calling for technical support.

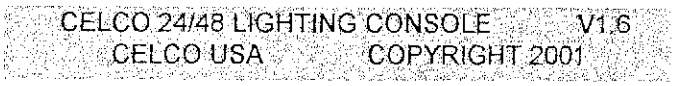


Figure 1

OPERATING MODE SELECTION - There are 3 operating modes available; 24 channel mode, 48 channel manual mode, and diagnostic mode. To select the operating mode, press the corresponding switch as indicated on the display. **NOTE:** This selection cannot be changed until the next power-up occurs. **See Figure 2.**

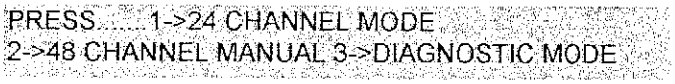


Figure 2

48 CHANNEL MANUAL MODE - Faders or sliders on the face of the lighting console set output levels in proportion to their position. All the way up sets the level to full on and all the way down is off.

In the 48 Channel Manual Mode, the top row of 24 **X** faders adjust levels for DMX512 output channels 1-24 and the second row of 24 **Y** faders adjust levels for DMX512 output channels 25-48. Further level adjustments are provided by the **X** submaster, **Y** submaster, and the **MASTER** faders. The **X** submaster affects all levels set by the **X** faders, the **Y** submaster affects all levels set by the **Y** faders, and the **MASTER** affects all output levels.

Bump push button switches, located along the bottom of the console front panel, are available for the first 24 output channels. When pressed, the corresponding output is set to maximum, as limited by the **MASTER** level.

A 40 character, 2-line liquid crystal display (LCD) allows viewing of 24 output channels at a time. Left and right arrow keys may be used to alternate the display window between viewing output channels 1-

24 and 25-48. Levels shown in the viewing window are in percent with FL indicating 100% or full on. **See Figure 3.**

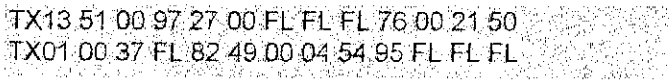


Figure 3

24 CHANNEL MODE - In the 24 Channel Mode, either manual or memory mode may be selected at any time using the **MEM/MAN** switch. This switch causes the controller to toggle between memory and manual modes. When in memory mode, the LED above the switch will be lit. **See Figure 4.**

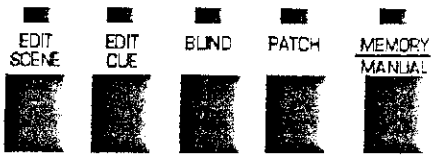


Figure 4

24 CHANNEL MANUAL MODE - Manual operation with two scene presets allows a scene to be playing from one row of faders while the other row of faders is being adjusted for the next scene. If the current scene is playing from the **X** row of faders, both the **X** and **Y** submasters should be in the up position setting the **X** scene full on and the **Y** scene full off. Set up the next scene on the **Y** row of faders, and for a dipless crossfade to the **Y** scene, simultaneously slide the **X** and **Y** submasters to the down position at the desired crossfade rate. Now the **Y** scene will be full on and the **X** scene will be full off. Continue by setting the next scene on the **X** faders then sliding the **X** and **Y** submasters to the up position. **See Figure 5.**

Note: The level indicators (0 to 10) to the right of the **Y** master fader are inverted when in 24 channel manual mode. That is, moving the **Y** master fader up towards 10 *decreases* **Y** scene level when in 24 channel manual mode. Conversely, moving the **Y** master down toward 0 *increases* the overall **Y** scene level. This reversal permits smoother crossfading between scenes, since the **X** and **Y** master faders can be moved in unison.

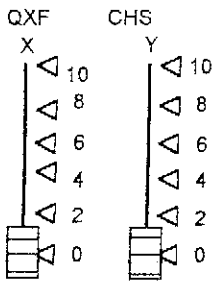


Figure 5

The **MASTER** fader usually remains at the maximum level but may be adjusted as desired.

Bump switches are live and when pressed, set the corresponding output to the maximum level set by

the **MASTER** fader.

All 24-output levels are shown in the LCD display window. The first line begins with "TX01," followed by the output levels of faders 1 through 12. The second line begins with "TX13," followed by the levels of faders 13 through 24. **See Figure 6.**

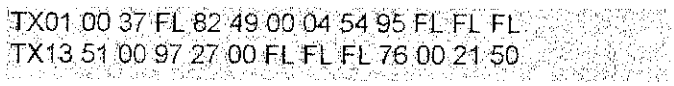


Figure 6

Patching is available in 24 channel manual mode. See Patching Operation in the 24 Channel Memory Mode section for details.

24 CHANNEL MEMORY MODE - In memory mode, output levels may be set from several sources: the **X** faders, the **Y** faders (which act as scene masters), a cue, a chase, or from the bump switches. The highest value set for each channel determines the output level for that channel, regardless of the source. As always, all output levels are limited to the ceiling set by the MASTER fader.

The top line of the display window shows 12 output levels at a time. "FD01" indicates that the first level shown is set from fader 1, and continue sequentially through fader 12. **See Figure 7.**

Figure 7

The left and right arrow keys may be used to alternate the display window between viewing levels set by faders 1-12 and 13-24. FD01 indicates that the displayed levels are from faders 1-12 and FD13 indicates that the displayed levels are from 13-24.

Line 2 of the display window shows which cue is currently playing, which cue will play next when the **GO** button is pressed and which scenes may be recalled using the **Y** scene masters. Line 2 also shows which chase is currently active (Chase C2 is shown active). If this area is blank, the chase function is currently off. On initial entry to the memory mode, the first cue will automatically be black ("**BLK**").

The **F2** key may be used to view and select the function of the bump switches as shown on line 2 of the display.

When "**BUMPS HOT**" is displayed, bumps set the corresponding DMX512 output level to the **Master** level. For example, while bump switch #1 is pressed, DMX512 output channel #1 will be set to the **MASTER** fader level (unless patched differently). Any other DMX512 output patched to fader #1 will also be set to the **MASTER** level. **See Figure 8.**

Figure 8

When "**BUMPS AND**" is displayed, pressing a bump switch sets the corresponding **SCENE MASTER** to full. For example, when bump switch #1 is pressed, Scene #1 is piled onto the DMX512 output. The

final result would be the same as if **Y** fader 1 was moved to full. **See Figure 9.**

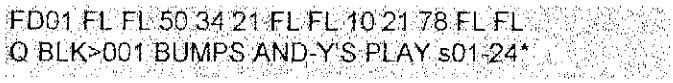


Figure 9

When "BUMPS OFF" is displayed, bump switches are not operational. **See Figure 10.**

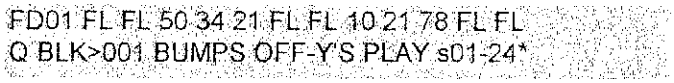


Figure 10

For extended lamp life and quicker response, a global lamp filament preheat adjustment may be set using the F1 key. Pressing the F1 key shows the "DMX PREHEAT" menu options. To set a new preheat, key in the desired level and then press ENTER. The DMX512 standard allows adjusting an output level in steps of one from 0 to 255. The preheat level can be set to any one of the first 25 DMX512 levels. To set the pre-heat level to 10% of full on, enter a preheat level of 25. The minimum level shown on the display will no longer be "00", but will be "10". Preheat adjustment using DMX512 levels instead of percent levels was selected to allow a finer adjustment, which may be desirable for certain lamps. **See Figure 11.**

Figure 11

Often, dimming equipment remains continually powered even when not in use. Many dimmers remember and hold the last received DMX512 level. To conserve power in this application, preheat should be turned off when the system is not in use and prior to powering down the controller. To quickly set the preheat level to zero, pull the master level fader to zero. Prior to turning off the controller, always pull the master fader to zero. **Note: Lamp preheat does not occur unless the master fader is set above zero.**

X FADER OPERATION - The **X** faders are live unless editing a scene or cue and may be used to adjust any output level on-the-fly. If a scene master or cue is currently sending a non-zero level to an output channel, the corresponding **X** fader cannot lower that level due to the pile on operation.

SCENE MASTER OPERATION - The **Y** faders act as scene masters and are used to recall previously recorded scenes or looks. There are 48 scene masters with 24 available at any one time. To get to the other 24, press the **PAGE** switch, which alternates the **Y** faders between recalling scenes 1-24 and 25-48. The current group of scenes that may be recalled by the **Y** scene masters is shown on line 2 of the display. If a **Y** scene master is not set at zero when the page switch occurs, an asterisk* will be displayed following the scene range in the display window. The asterisk indicates that one or more scene masters are not on the current page. When a scene master is moved down to zero, it will automatically move to the current page.

Scenes can be recorded or edited using the **EDIT SCENE** switch. To enter or exit the edit scene mode, press the **EDIT SCENE** switch. To edit without affecting the current look on stage, press the **BLIND** switch before entering the edit scene mode. When in blind mode, the blind LED is lit and output levels

are locked. When in the edit scene mode, the **EDIT SCENE** LED blinks and if not in the blind mode, editing changes will be visible on the attached lighting.

Line 1 of the display window shows scene levels being edited for 12 channels at a time. Again, the left and right arrow keys may be used to alternate between viewing channels 1-12 and channels 13-24. Line 2 shows the scene number being edited. To edit a different scene number, just key in the desired scene number (01 to 24). The **ENTER** key is not required. **See Figure 12.**

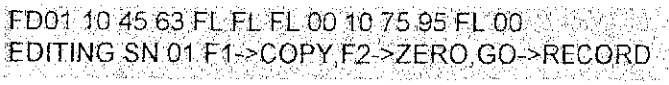


Figure 12

Press **F1** to bring up the Scene Copy menu. Then key in the number of the scene to be copied, and press **ENTER**. **See Figure 13.**

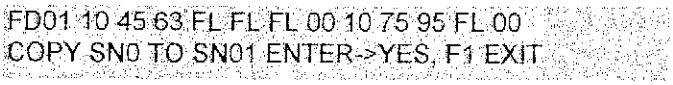


Figure 13

Press **F2** to bring up the zero scene menu. Press 1 to confirm, or 0 to return to the previous menu. **See Figure 14.**

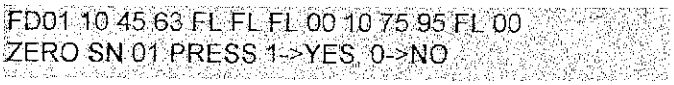


Figure 14

The **X** faders are used to edit the scene levels. When an **X** fader is moved to zero and then to the current recorded level, it becomes a live fader and may set the value to be recorded to any level. When all scene levels have been set, press the **GO/REC** button to record the new scene. The display will momentarily indicate that the scene was recorded. **See Figure 15.**

Figure 15

CUE OPERATION - Cues are similar to scenes except that they are recalled using the **GO/REC** button instead of a fader. Crossfade transition times from one cue to the next are manually set from immediate to 10 seconds using the **QXF** (Q crossfade rate) fader. Up to 180 cues may be recorded, edited, and played back in sequence.

Cues can be recorded or edited using the **EDIT CUE** switch. To enter or exit the edit cue mode, press the **EDIT CUE** switch. To edit without affecting the current look on stage, press the BLIND switch before entering the edit cue mode. When in blind mode, the **BLIND** LED is lit and output levels are locked. When in the edit cue mode, the **EDIT CUE** LED blinks and if not in the blind mode, editing changes will be visible on the attached lighting.

Line 1 of the display window shows scene levels being edited for 12 channels at a time with the arrow keys used to alternate between viewing channels 1-12 and 13-24. Line 2 shows the cue number being

edited. To edit a different cue, just key in the desired cue number (001 to 180). The **ENTER** key is not required. **See Figure 16.**

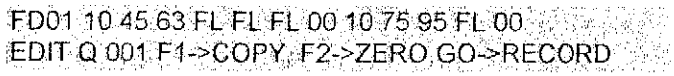


Figure 16

Press **F1** to bring up the Cue copy menu. Next, key in the number of the cue to be copied, and press **ENTER**. **See Figure 17.**

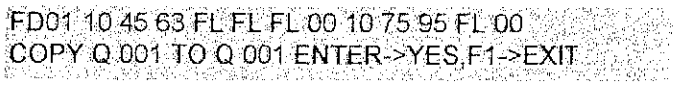


Figure 17

Press **F2** to bring up the zero cue menu. Next, key in the number of the cue to be set to zero, and press **ENTER**. **See Figure 18.**

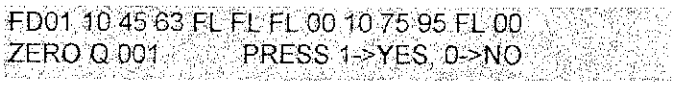


Figure 18

The **X** faders are used to set the associated channel levels. When an **X** fader is moved to zero and then to the current recorded level, it becomes a live fader and may set the value to be recorded to any level. When all channel levels have been set, press the **GO/REC** button to record the new cue. The display will momentarily indicate that the cue was recorded. **See Figure 19.**

Figure 19

To exit the edit cue mode, press the **EDIT CUE** switch.

PATCHING OPERATION - The first 120 DMX512 output addresses (also referred to as "channels" or "dimmers") may be controlled from the 24 **X** faders on the C-24 controller using the soft patch feature. Patching connects each of the 120 output addresses to any one of the 24 source faders. **See Figure 20.**

Figure 20

Note: The **PATCH** feature is only available in 24 channel mode. In 48 channel manual mode, the 48 **X** and **Y** faders control the first 48 DMX512 channels and may not be reassigned.

The **PATCH** switch may be used to edit a patch, turn the patch function on or off, or to load the default patch. To view or change the current patch setup, press the **PATCH** switch, and select the edit patch function by pressing **2**. Line 1 of the display shows the DMX512 address and directly below, line 2 shows the fader number that controls that DMX512 address. **See Figure 21.**

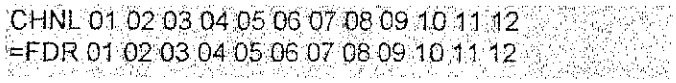


Figure 21

To change a patch, use the arrow keys to move to the desired channel number, then enter a new fader number. Patch changes do not take effect unless the **ENTER** key is pressed. The **ENTER** key also moves the display window to the next group of 12 patches. If a number larger than 24 is entered as a fader number, a "?" will appear to indicate the error.

Patching may be turned on or off by pressing **1** (to exit with patching on) or **0** (to exit with patching off). When patching is off, levels for the first 24 DMX512 address are transmitted. When patching is on, the PATCH LED will be illuminated and levels may be transmitted for the first 120 DMX512 addresses.

The default patch connects DMX512 addresses 1, 25, 49, and 73 to fader 1, DMX512 address 2, 26, 50, and 74 to fader 2, etc. Load the default patch by pressing **3** while in patch mode. The display asks for a "load default patch" verification before overwriting the current patch information. **See Figure 22.** Note: Custom patches may not be recalled after the default patch is loaded.

Figure 22

CHASE OPERATION - The **CHASE** switch is used to recall and play 1 of 8 pre-recorded chase sequences, to record a new chase, or to turn off the chase function. Two types of chase are available; chase cues, and chase pattern.

As the name implies, chase cues sequence through and set levels using cue memory. Cue data to be used for a chase must be recorded using the edit cue function described previously in the Cue Operation section. To record a new chase cue sequence, press the **CHASE** switch, then press 9 to record, then select a chase cue memory number from 1 to 7. Next, enter the desired start cue number, the last cue number, then press **ENTER**. The chase is now recorded. Cue chase direction may be either forward or reverse and is determined by the order of the start and end cue numbers.
See Figure 23.

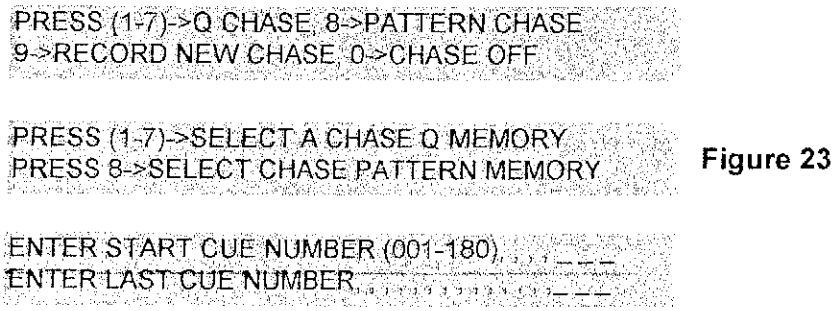


Figure 23

Chase pattern uses a single recorded cue as the seed for a rotating chase pattern. To record a new chase pattern sequence, press the CHASE switch, number 9 to record, then select chase memory number 8. Next, enter the desired pattern cue number, the start fader number, the end fader number,

then press **ENTER**. The pattern chase is now recorded. **See Figure 24.**

```
ENTER CHASE CUE NUMBER (001-180) _ _ _
START FADER # (01-24) _ _, END FADER # _ _
```

Figure 24

The start and end fader numbers define the boundaries of the channels that will chase while the cue data inside these pattern boundaries set the chase levels. For example, if the start fader number is 10 and the end fader number is 20, only channels 10 through 20 will chase. At each chase step, the chase levels shift forward to the next highest output channel (except for channel 20 which wraps back to channel 10). If the start fader number is set to 20 and the end fader number is set to 10, the chase will be similar but will chase in the opposite direction.

To play a chase, press the **CHASE** switch, key in the chase memory number (1-8) and press the **ENTER** key. The selected chase will begin immediately. If a chase is already playing and the **CHASE** switch is pressed, chasing stops until exiting the chase mode.

The chase function may be disabled at any time by pressing the **CHASE** switch and then pressing the 0 key.

Chase speed and chase lighting intensity may be set using the **CHASE RATE** and the **CHS LVL** faders.

DIAGNOSTIC OPERATION - The C-24 lighting console may be fully "checked out" by the user by entering diagnostic mode following power up. When the initial operating mode select menu appears, press **3**.

In diagnostic mode, the display, all faders, all switches, and all LED's, memory and DMX512 driver outputs may be functionally tested. The display is used to show the level setting of each fader. Arrow keys may be used to alternate the display between the X faders, Y faders, and the control faders.

LED's above the keypad are used to verify switch operation. When a keypad key is pressed, the LED above that switch should light. Bump switch number 1 lights the left most LED, bump switch 2 the next LED, etc.

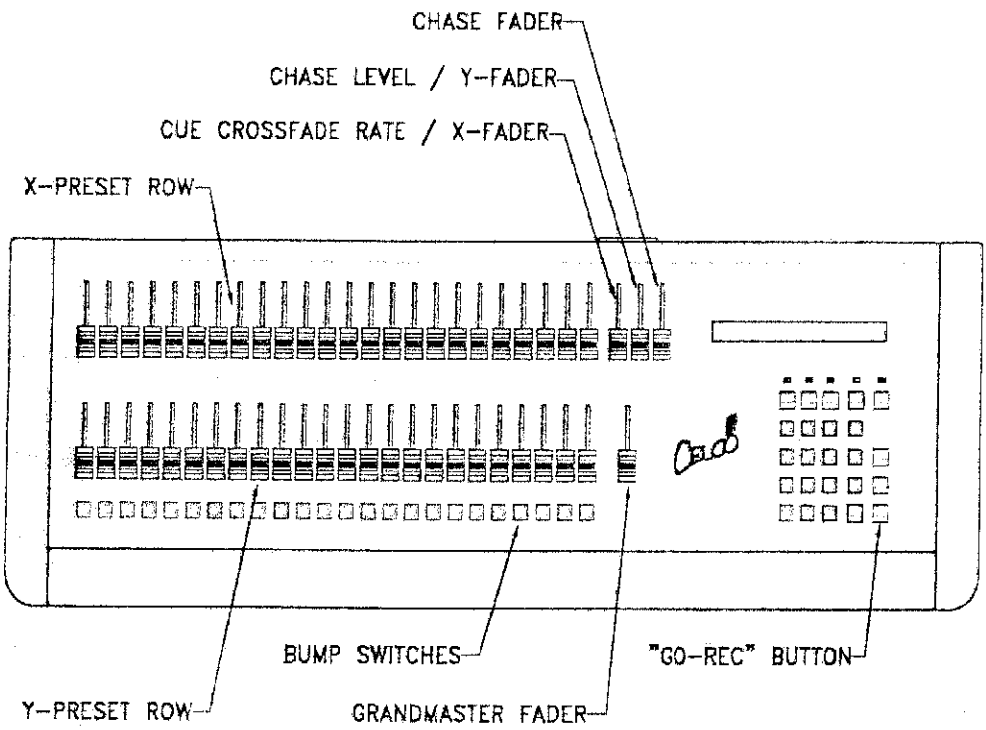
If a DMX512 driver failure or memory error is detected, an error message will be displayed. When an error is displayed, diagnostic testing halts until the "GO" switch is pressed. **See Figure 25.**

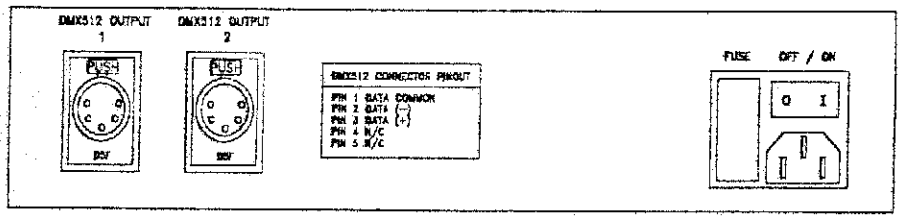
```
HARDWARE ERROR FOUND ON DMX OUTPUT 1
FD13 51 00 97 27 00 FL FL FL 76 00 21 50

FD01 00 37 FL 82 49 00 04 54 95 FL FL FL
HARDWARE ERROR FOUND ON DMX OUTPUT 2

EXTERNAL MEMORY ERROR DETECTED
FD13 51 00 97 27 00 FL FL FL 76 00 21 50
```

Figure 25





Rear View of Celco-24 Back Panel

Engineers and Architects Specifications:
The Celco Series C-24

Acceptable dimensions for the controller enclosure shall be 32.5" wide, 3.5" high, and 12" deep. Weight for the controller shall not exceed 16 pounds.

The Celco C-24 Lighting Controller shall have 2 pages of scene masters with 24 memories each page, together totaling 48. There shall be 24 separate scene master faders (in the 24 channel memory mode) to recall, up to 24 scene masters at one time with an overlapping pile-on type operation. If any scene master is in use at the time of page transition, those scene masters in use shall not change to the new page information until they are individually brought to zero level, at that time the new page information shall be loaded. These scene masters shall be editable in either blind or live mode.

The C-24 shall have the ability to record and playback 180 separate cues. These cues shall be editable in blind or live mode. Cue crossfade time shall be adjustable in real time from a front panel "QXF" fader. Transition time range shall be from instant (min) to 10 seconds (max) and shall be initiated by pressing the GO-REC switch. These cues can be recalled one by one, simultaneously with any scene master fader, bump switch activity or other console function.

The C-24 controller shall also feature a Grandmaster fader that controls the overall level of the final output signals of all 24 control channels. No function shall override the Grandmaster fader.

The Blind operation mode shall cause all output channels to be held or frozen when the Blind LED is active.

The controller shall also have 24 bump buttons to bring the output level of the first 24 channels up to the setting of the Grandmaster fader.

The controller shall have the ability to soft patch any of the 24 control channels to any one of the first 120 DMX512 output addresses.

Eight programmable Chase functions are available. These are editable and have live adjustable rate and intensity playback fader control.

There shall be 24 faders that shall offer live control of the 24 channels unless an edit function is active. These 24 faders shall also serve as the data entry point for editing scene master and cue information.

The console shall have an 80-character (2 lines of 40 characters each) backlit LCD display.

The console shall operate on 120 VAC 50/60 Hz and shall be powered by an internal low voltage power supply. Any type of wall mount or other type of external power supply shall not be necessary for console operation. Operational voltage of the C-24 console shall be from 65 VAC to 140 VAC without failure. A rear panel accessible .250 amp fuse shall be incorporated to protect internal power supply from excessive line voltage. A battery back-up memory shall store scene master and cue information for up to 10 years in the event of a power failure or voltage fluctuation beyond the operation range of the controller.

The console shall provide (2) DMX512 duplicate signals meeting the current USITT specifications. Data update or framing rate shall be at least 45 times a second in any mode of console operation. All 255 dimming levels supported by the DMX512 protocol shall be implemented. Output connections shall be rear accessible. The back panel shall contain 2 separate DMX512 output connectors. The DMX512 outputs shall have separate logic drivers so that in the event of external voltage damaging a DMX512 driver, a second output shall still be operational. The C-24 controller shall be designed to operate safely with ambient temperature not exceeding 40 degrees Celsius (104 degrees Fahrenheit). No forced air cooling of the enclosure shall be required.

The console shall have a padded armrest and solid oak wood ends. All nomenclature shall be screened in epoxy ink.

Celco C-24 Lighting Console shall be covered by a 12-month factory warranty.