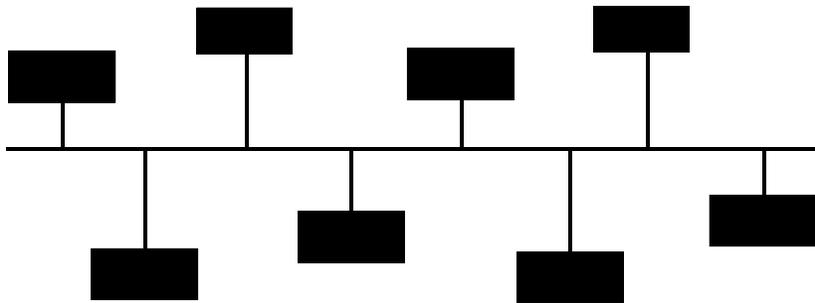
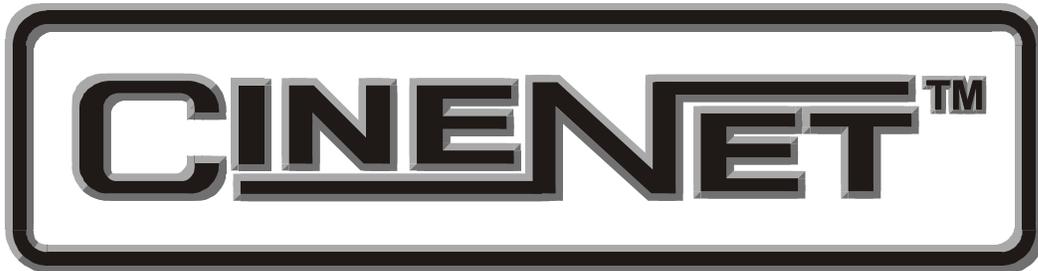


CNA-100 Automation



Setup and Operation Manual



Revision 2.00
March 2005

CNA 100 Automation Setup and Operation Manual

PR004 Revision 2

This manual covers the setup and operation of CNA-100 automation system.

Optional CineNet and related equipment is covered in the following product reference manuals:

- PR001 CNA Installation Manual
- PR002 CNA-200 Setup and Operation Manual
- PR003 CNA-150 Setup and Operation Manual
- PR004 CNA-100 Setup and Operation Manual
- PR005 QDC-400 Installation and Setup Manual
- PR006 ACP-50 Installation and Setup Manual
- PR007 RVC-5 Installation and Setup Manual
- PR008 PCI-64 Gateway Interface Installation
- PR009 CineNet Host Software
- PR010 RCM-10/RSM-10/RSM-20 Installation and Operation Manual
- PR011 Strong Dimmer Installation, Setup, and Operation Manual
- PR012 eCNA-100 Automation Manual
- PR013 eCNA-150 Automation Manual
- PR014 eCNA-200 Automation Manual
- PR016 Strong FP350 Installation and Operation Manual
- PR017 Eprad FP350 Installation and Operation Manual
- PR018 Paging system Setup and Installation Manual
- PR019 VNC Setup and Operation Manual
- PR020 CineSuite Installation and Operation Manual

Warranty

CineNet automation products, sold by STRONG INTERNATIONAL, are warranted against defects in materials and workmanship for one year from the date of purchase. There are no other express or implied warranties and no warranty of merchantability or fitness for a particular purpose.

During the warranty period, STRONG INTERNATIONAL will repair or, at its option, replace components that prove to be defective, provided the unit is shipped prepaid to the manufacturer directly or via an authorized distributor. Not covered by this warranty are defects caused by modification, misuse or accidents and any further damage caused by inadequate packing for service return.

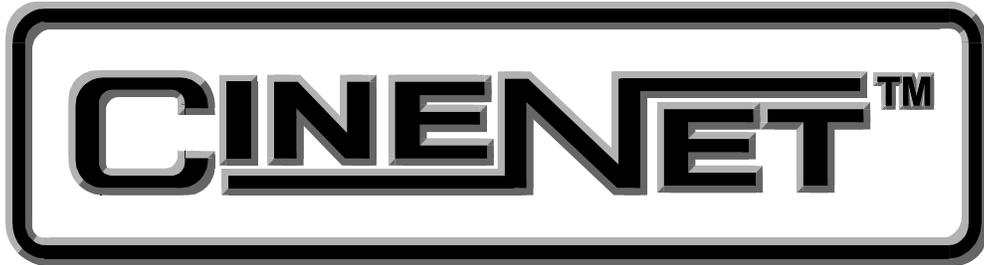
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An Introduction to THE CINENET™ SYSTEM

Strong International's CINENET™ is an automation and control network designed specifically for the Motion Picture Theatre Industry. CINENET™ provides a low cost connection to various control and I/O devices in the projection booth, auditorium, and throughout the theatre complex. CINENET™ is divided into two network layers: The Local Synchronous Network (LSN) is a complex-wide data network that provides advanced synchronous projector control, user selected data transfer and real-time remote automation status. The Local I/O Network (LIN) is designed to provide remote I/O control for each screen in a complex. The CINENET™ network offers many advantages over point-to-point wiring such as reduced installation costs, reduced wiring errors and high noise immunity. CINENET™ also allows management to program and access real-time status of all auditoriums in the theatre complex from a central location using a personal computer. Strong will continue to develop new CINENET™ products that will provide the control and flexibility the theatre industry demands.

Section 1

SYSTEM OVERVIEW

The CNA-100[®] Cinema Network Automation is a CINENET[™] compatible automation system specifically designed for the Motion Picture Theatre industry. The system is modular in design, consisting of the operator interface and system peripherals. The Main Computer and each peripheral device is defined by its common functions and locations in the booth. The devices within the system communicate with each other on a serial communications link. Automation systems and remote stations distributed throughout the booth and other areas of the multiplex communicate on a second serial communications link.

The CNA-100 operator interface is user friendly and self-intuitive. Once some basic rules are learned you will be programming and running basic programs in less than an hour.

To enhance the operation of the CNA-100 and provide a higher level of control, the CINENET[™] Gateway PC Card and Host software is available. This product will provide a PC interface to the CNA-100 automations. The Host PC and software will allow management to access programming, data logging and diagnostic information from all systems connected to the network. Access to data and system upgrade software will also be available via the modem/Internet.

This manual provides the installer and user with the necessary information to install, setup and operate the CNA-100 automation system. The installer is encouraged to read all sections of the manual before proceeding with the installation. If while installing or operating the CNA-100 automation you find any part of the manual to be unclear or incorrect, please let us know. Call STRONG INTERNATIONAL at (800)-424-1215 if help or additional information is required.

Product Description

The CNA-100 Cinema Network Automation System is a microprocessor based computer automation designed to automate all aspects of the theatre presentation. The major features of the CNA-100 are listed below.

Local I/O Network (LIN)

Each system component is connected to the network and communicates via a five wire cable. This cable provides the serial communications as well as power to the termination panels. This is called the "Local I/O Network" or "LIN". The standard devices that make up the system are the:

1. Console Termination Panel
2. Booth Termination Panel
3. CNA-100 Control Panel

The CNA-100 Automation Control Panel contains the Main or Master Computer of the system and each I/O device is connected to it via a serial communications link. The devices are connected in a "daisy-chain" method and can then be distributed within the booth according to their logical location.

Local Synchronous Network (LSN)

The "Local Synchronous Network" is a two-wire data link that will support CNA-100/150 and CNA-200 Automations, remote stations, synchronous communications for interlock, network copy functions and a Host PC. The automation systems are connected together in a "daisy-chain" configuration, which allows the transmission line to continue from one unit to the next.

System Components

The standard components that make up the automation system LIN are described in the following sections.

Control Panel (Operator Interface)

The automation controller and front panel interface is a self-contained unit that can either be surface mounted to the booth wall or can be mounted in a standard 19" rack. The unit will house the main CPU, the front panel interface and the power supply for local and remote power for the Local I/O Network.

Communications to the local I/O devices and other remote CNA-100 systems is accomplished via two serial ports on the Main CPU:

The Local I/O Network (LIN) Com Port - This is the interface for the Local I/O Network that will support the Main I/O Interface, the Console and Booth Termination Panels and other auxiliary devices.

The Local Synchronous Network (LSN) Com port - This is the interface for the Interlock and Copy function between CNA-100 systems, Remote Monitors and PC Host.

The front panel is used to setup, program and run the shows. It also displays error and status messages to the user. The front panel incorporates up to nine manual override switches used for emergency manual control. These are rocker type switches and their general functions should be obvious to the operator. All manual controls circumvent the electronic circuitry giving the user the ability to control the major functions in the event of an automation failure. The manual control functions are listed below:

1. PROJECTOR - Maintained ON/AUTO
2. LAMP - Maintained
3. CHANGEOVER - Momentary OPEN/CLOSE
4. LENS - Momentary FLAT/SCOPE
5. LENS - Momentary SPECIAL
6. CURTAIN - Momentary OPEN/CLOSE
7. HOUSE LIGHTS - Momentary UP/DOWN
8. STAGE LIGHTS - Momentary UP/DOWN
9. AUXILIARY - Momentary ON1/ON2

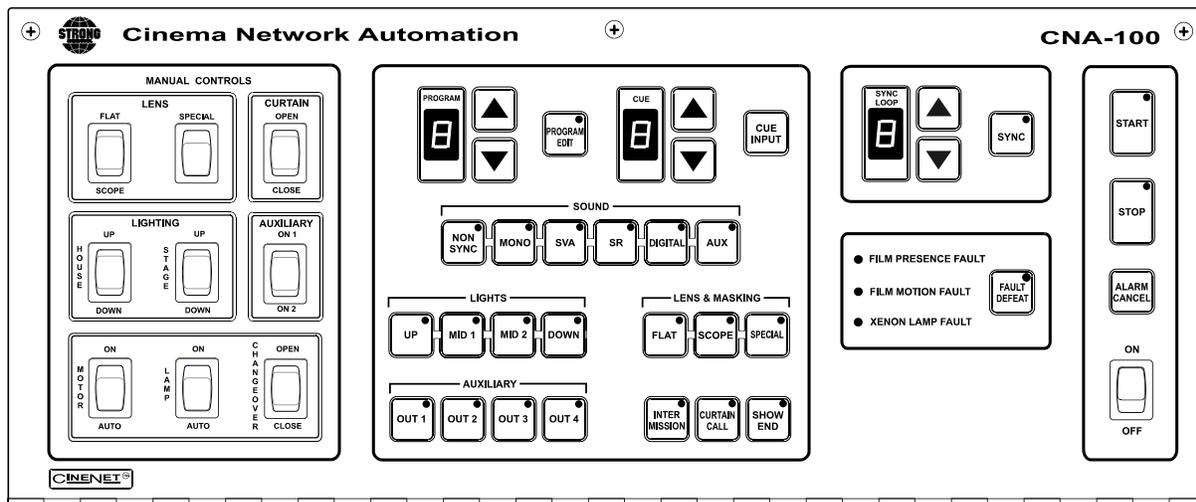


Figure 1

Keypad and Display

Program Number

Displays the program number to run or edit. Use the up and down cursor keys to select the program number. Up to nine unique programs can be saved.

Cue Number

Displays the show cue number. During programming use the up and down cursor keys to select the cue number to edit. Up to nine cues can be programmed for a show.

Programming Keys

These keys are used to program the sound, lens, masking, lights, intermission, curtain call and end of show. LEDs are on each key. The LED is "on" indicating the present state of the output during a show.

Program Edit Key

This key is used to enter the program edit mode allowing the user to build new or alter existing programs. The LED is on when "program edit" is active. The user may edit any program during a show or between shows.

Start Key

This key is used to start or restart a show. The LED on the start key will "blink" when the show is *ready to start* or *ready to restart*. The LED is "on" when the show is running, and "off" when the show is stopped.

Stop Key

This key is used to stop a show. The LED on the stop switch is "on" when a show is stopped, due either to a "local" or "remote" stop input or a fault.

Sync Key

This key is used to activate the automation for synchronous (interlock) operation. The sync LED will be "on" indicating the automation is in sync mode.

Sync Loop Number

This displays the Sync Loop number. Use the up and down cursor keys to change the loop number. Up to 9 different loops can be on the sync network. 0 disables the machine from sync operation. The user is prevented from changing the Sync Loop number when sync is enabled with the Sync Key.

Fault Status LEDs

These LEDs display the status of the fault conditions: *Film Presence*, *Film Motion* and *Xenon Fault*. The LEDs are "off" when there is no fault present. When a fault exists, the LED will "blink" rapidly.

Power Switch

Supplies power to the automation main controller and termination panels.

Fault Defeat Key

This key will defeat or bypass the fault inputs (film presence, film motion and xenon lamp). This key is normally used for testing the projection equipment or newly edited programs. It is *not* recommended for normal operation. The LED will "blink" when the Fault Defeat is activated.

Alarm Cancel Key

This key will cancel the local alarm and all remote alarms. This key is also used to clear any of the latched faults. Pressing the Alarm Cancel key once will cancel the alarm. Pressing the key again will clear the fault condition.

Cue Input Key

This key provides a manual cue input. This is similar to the cue input from the electronic cue detector or pick off. This key is always active during a show.

Console Termination Panel

This panel supports the input and output termination interface and provides connections for standard booth functions as listed below:

Outputs:

- Projector Motor; On/Off
- Xenon Lamp; On/Off
- Changeover; Open/Close
- Lens Turret; Flat/Scope/Special
- Auxiliary Output; On/Off

Inputs:

- Film Presence
- Film Motion
- Film Tension
- Cue Input
- Xenon Fault

Features:

- High power *dry* relay contact outputs.
- High power override connector for plug-in cable to override switches.
- Projector motor fuse.
- Plug-in I/O CPU Control Board to handle I/O and serial interface.
- Terminal Blocks for connection to the console equipment.

The relays and I/O CPU Control Board get their power from the network cable. The Control Board will plug onto the relay board to provide the I/O and network interface.

Booth Termination Panel

This panel provides the outputs to control the following functions:

Outputs:

- Top Masking; Flat/Scope/Special
- Side Masking; Flat/Scope/Special
- Curtains; Open/Close
- House Lights; Up, Down, Mid 1, Mid 2
- Stage Lights; Up, Down
- Environment; On/Off
- Slide Projector; On/Off
- Sound Processor; Mono, SVA, SR, Digital 1, Digital 2, Aux 1, Non-sync, Mute, Aux 2, Preamp 1, and Preamp 2.

Inputs:

- Remote Start
- Remote Stop

Features:

- Low power dry relay contact outputs.
- High power dry relay contact outputs for Slide Projector and Environment Control
- A plug-in I/O CPU Control Board to handle I/O and serial interface.
- Override connector for plug-in cable to override switches.
- Override connector for optional override switches.
- Large terminal blocks for user interface.

This Panel (PC board) will connect to the to the Local I/O Network (LIN). The outputs can be configured at the PC Host.

The relays and plug-in I/O CPU Control Board get their power from the LIN cable. This board will generally be mounted in a cabinet on the booth wall, but can also be mounted in the console next to the Console Termination Panel.

Single Termination Panel

This panel provides the outputs to control the following functions:

Outputs:

- Xenon Lamp; On/ Off
- Projector; On/ Off
- Changeover; Open/ Close
- Slide Projector; On/ Off
- Sound Processor; Mono, SVA, SR, Non-Sync, Digital, Aux, And Mute.
- Lights; House up, House Mid 1, House Mid 2, House Down, Stage Up, Stage Down.
- Curtain; Open/ Close
- Masking; Flat/ Scope/ Special
- Lens; Flat/ Scope/ Special

Inputs:

- Film Motion
- Film Presence
- Film Tension
- Cue
- Xenon Fault

Features:

- Low power dry relay contact outputs.
- High power dry relay contacts for Xenon Lamp, Projector Motor, Changeover Open/ Close, and Slide Projector.
- A plug-in I/O CPU Control Board to handle I/O and serial interface.
- Override connector for plug-in cable to override switches.
- Override connector for optional override switches.
- Large terminal blocks for user interface.

This Panel (PC board) will connect to the to the Local I/O Network (LIN). The outputs can be configured at the PC Host.

The relays and plug-in I/O CPU Control Board get their power from the LIN cable.

Section 2

SETUP

Please note at this point you should have completed the entire installation of the automation system. If you have not, refer to the *CNA Installation* manual before proceeding.

Configuring the System

The LSN can support up to 64 devices (CNA-100/ 150s, CNA-200s, Remote Status Monitors, dimmer control cards, and a Host Computer). **Each device will each require a unique Sync Id number.** Id 0 is reserved for the *Host PC* and Ids 1 through 63 are assigned to CNA-100s and other devices as necessary. To keep things simple, assign the CNA-100 Ids starting at 1, corresponding to the house number and working up. The Remote Monitor's Ids, if used, should be assigned to the higher numbers starting at 62 and working down. You may want to keep Id 63 reserved for the portable or *secondary* host.

To set the Id number, first locate the eight position dip switch designated SW1. See figure 2.

CNA-100/ 150 DIP Switch Settings

Current to Version 2.15/ 3.15

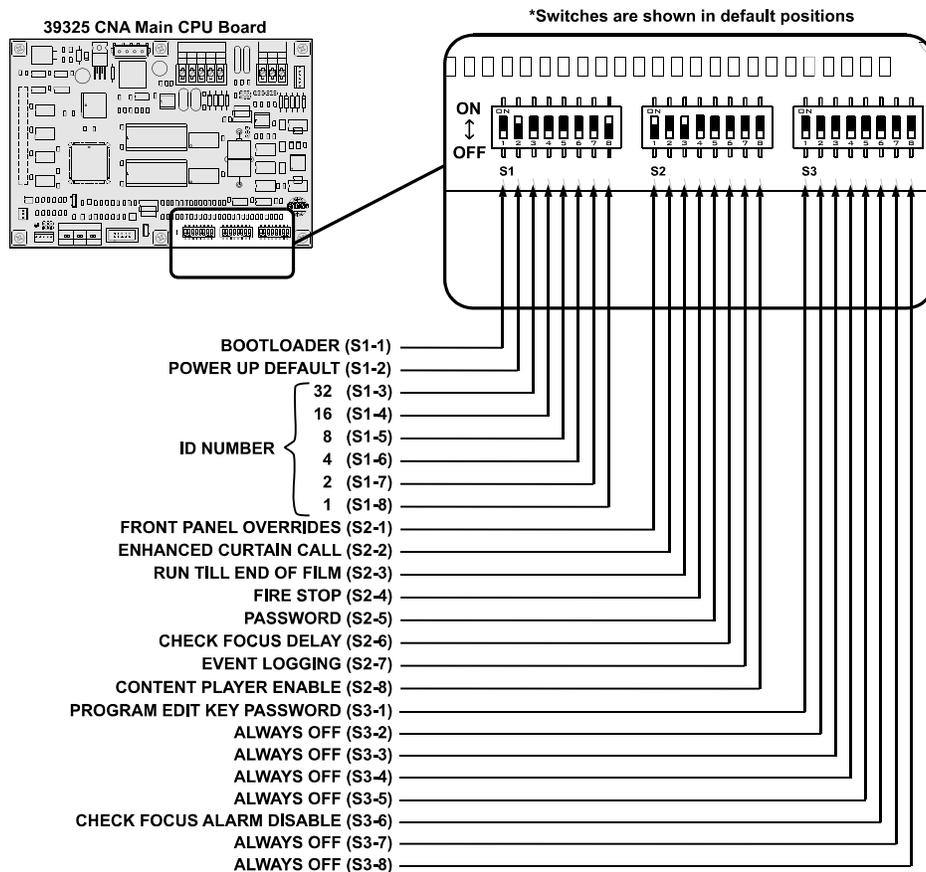


Figure 2

Switch Definitions

S1-1 Force Bootloader

On : Force Bootloader.

Off : Normal Use. (Factory Default)

Forces bootloader program at power-up in the event of a RTOS failure.

Note: Version 1.00 and up

S1-2 Supervisory Defaults

On : Force “Supervisory Defaults” on power up. Default Supervisory data will be restored on each power up. (Factory Default)

Off : Will **not** overwrite user-programmed supervisory data on power up.

If you change any of the default settings with the Host program this switch must be off or the next time the CNA-100 is powered up all user settings will be over-written with the defaults.

Note: Version 1.00 through Version 1.08

S1-3 through **S1-8** are used to set the ID number. The number is represented as a 6-bit binary number which allows for 64 possible ID numbers (0-63). Do not use 0 (zero) as an ID number. It has been reserved for the PC Gateway Interface. Each bit (switch) has a decimal value. Add up the decimal values to get the ID number. For example, ID number 15 would be $8+4+2+1=15$ or a DIP switch setting of 001111. See Figure 3.

S1-3 On : 1 Decimal value = 32
Off : 0 Decimal value = 0 (Factory Default)

S1-4 On : 1 Decimal value = 16
Off : 0 Decimal value = 0 (Factory Default)

S1-5 On : 1 Decimal value = 8
Off : 0 Decimal value = 0 (Factory Default)

S1-6 On : 1 Decimal value = 4
Off : 0 Decimal value = 0 (Factory Default)

S1-7 On : 1 Decimal value = 2
Off : 0 Decimal value = 0 (Factory Default)

S1-8 On : 1 Decimal value = 1 (Factory Default)
Off : 0 Decimal value = 0

Note: Version 1.00 through Version 1.08

OFF=  ON= 	ID = 16 	ID = 32 	ID = 48 
ID = 1 	ID = 17 	ID = 33 	ID = 49 
ID = 2 	ID = 18 	ID = 34 	ID = 50 
ID = 3 	ID = 19 	ID = 35 	ID = 51 
ID = 4 	ID = 20 	ID = 36 	ID = 52 
ID = 5 	ID = 21 	ID = 37 	ID = 53 
ID = 6 	ID = 22 	ID = 38 	ID = 54 
ID = 7 	ID = 23 	ID = 39 	ID = 55 
ID = 8 	ID = 24 	ID = 40 	ID = 56 
ID = 9 	ID = 25 	ID = 41 	ID = 57 
ID = 10 	ID = 26 	ID = 42 	ID = 58 
ID = 11 	ID = 27 	ID = 43 	ID = 59 
ID = 12 	ID = 28 	ID = 44 	ID = 60 
ID = 13 	ID = 29 	ID = 45 	ID = 61 
ID = 14 	ID = 30 	ID = 46 	ID = 62 
ID = 15 	ID = 31 	ID = 47 	ID = 63 

Figure 3

S2-1 Front Panel Overrides

On : Enable front panel overrides. The Sound, Lights, Lens/Masking and Auxiliary front panel switches will override the outputs without affecting the program. The next instruction will override any manual changes. (Factory Default)

Off : Disable front panel overrides. The Sound, Lights, Lens/Masking and Auxiliary front panel switches are only used for programming.

Note: Version 1.00 through Version 1.08

S2-2 Curtain Call

On : Enables the new Curtain Call function and overrides the original Curtain Call function.

Off : Original Curtain Call function. (Factory Default)

Place the Curtain Call cue at a distance before the next cue that is equal to the curtain close time. When the CNA-100 sees the Curtain Call cue, the curtains begin to close, the changeover closes and sound is muted. At the next cue, the curtains will begin to open.

After the CURTAIN CLOSE TIMER counts down to zero, the curtain will be fully open and the changeover will open and the sound is selected.

Note: Version 1.07 through Version 1.08

S2-3 Run Til' End of Film

- On : Enables the "Run til End of Film" function. This overrides the normal 7 second motor off delay. The projector motor will run until the film runs out of the failsafe. (Factory Default)
- Off : Disables the "Run til End of Film" function. The projector motor will shut off after the normal 7 second delay.

Note: Version 1.07 through Version 1.08

S2-4 Fire Stop

On : Enables the "Fire Stop" function.

39331 Booth Termination Board - Converts the Remote Stop input to a Fire Stop input and the Slide Projector relay (K13) to a Fire Stop output. Fire Stop *acts* like a Remote Stop with the following exceptions:

- Sound is Muted.
- Slide Projector on *39330 Console Termination Board* is turned off *or* held off on.
- K13 relay (Slide Projector) on Booth Termination board is turned on.

39332 Termination Board - Remote Stop input must be enabled on board. (W1-OPT1 jumper across pins 2 and 3 changes the Film Tension input to a Remote Stop input.) Converts the Remote Stop input to a Fire Stop input. Fire Stop *acts* like a Remote Stop with the following exceptions:

- Sound is Muted.
- Slide Projector is turned off *or* held off.

Off : Disables the "Fire Stop" function. (Factory Default)

Note: Version 1.08

S2-5 Password

- On : Password required to edit most functions
- Off : No Password required (Factory Default)

Note: This feature can be software overridden from the host PC. In Versions 2.15 and up

S2-6 Check Focus Delay

On : Enabled

Off : Disabled (Factory Default)

The Check Focus feature alerts the operator that the show is about to start. The alarm will begin to sound 7 seconds prior to the show starting. This gives the operator time to make any quick adjustments and to insure the image on the screen is in focus.

Note: Version 2.030 and above

S2-7 Event Logging

On : Enables Event logging

Off : Event Logging Disabled (Factory Default)

Writes a log of events to a file on the HOST computer when enabled.

Note: Version 2.040 and up

S2-8 Content Player Enable

On : Enabled

Off : Disabled (Factory Default)

This switch allows the eCNA to interact with a digital content player. Serial commands exchanged between the content player and CNA automation allows the digital projector and film projector to share the screen in a coordinated manner

** See CAI user Guide, Version: 2.090 and above.*

S3-1 Program Edit Password

On: Password required key only operational when password is entered, Programs can be viewed but not edited.

Off: No Password required to edit programs

“View Only” mode is indicated by flashing program edit LED.

Version: 2.11 and Up

S3-6 Enable RCM/ RSM-10 “Check Focus Alarm”

On : Disables the Check focus alarm on the RSM-10, RCM-10

Off : Enables the Check Focus alarm on the RSM-10, RCM-10

Version 2.15 and up only, see check focus delay description.

S3-2 to 3-5, S3-7 and 3-8 Always Off (Factory Default)

These Switch Positions are currently undefined and should remain in the “OFF” position.

Alarm Loudness setting

The alarm loudness can be set for one of three intensities; LOW (87 dBA), MEDIUM (94 dBA), HIGH (98 dBA). See figure 4 below.

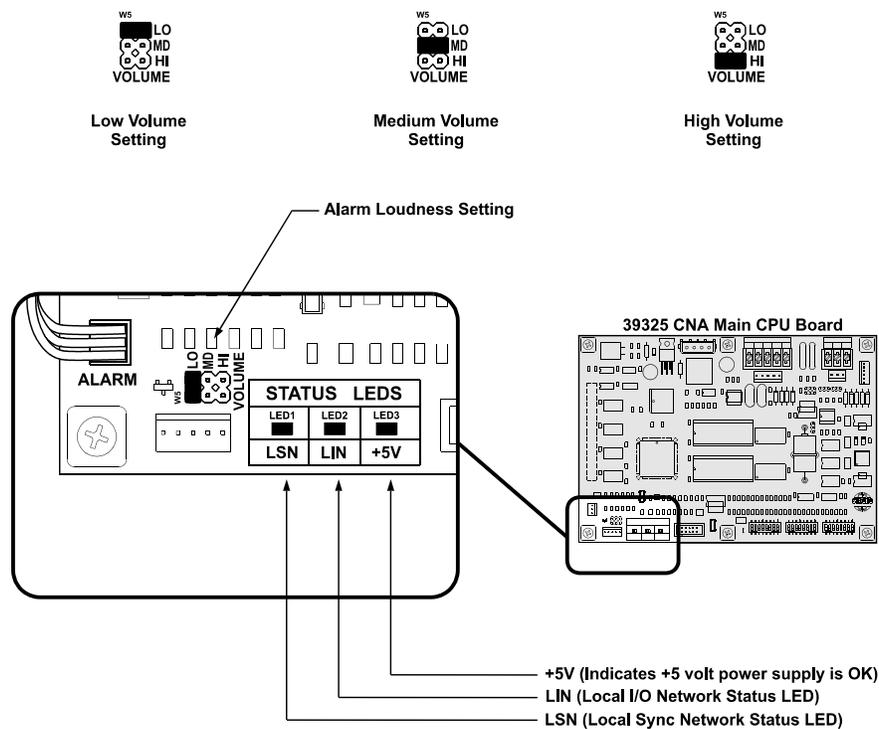


Figure 4

Status LEDs

There are three status LEDs on the 39325 Main CPU Board. These indicate the status of the +5 volt power supply, the LSN and the LIN. Following are the three conditions for the LIN and LSN LEDs:

Fast Blinking Rate: The CNA-100 computer is working and is communicating properly.

Slow Blinking Rate: The CNA-100 computer is working, but is *not* communicating.

Off: The CNA-100 computer has a problem.

Programming the CNA-100

Programming is accomplished with the *Programming* keys and the *Program* and *Cue* numbers. The CNA-100 gives the user the ability to build and store up to 9 different programs. Each Program can use up to nine cues.

The following steps describe how to edit a program:

1. Press the PROGRAM EDIT key to activate the *edit mode*. The PROGRAM EDIT LED will toggle "on". The CUE up and down arrow keys are enabled and the PROGRAM and CUE displays will stop blinking *if* show is in progress.
2. Select the program to edit with the PROGRAM up or down arrow keys.
3. Program the Sound, Lens and Lights for each cue using the programming keys. Program the Auxiliary outputs (OUT 1 through OUT 4) if an 'Aux Board' is connected to the system. One or more of these outputs can be on at a time.
4. Use the SHOW END key to indicate the end of the program.
5. Select a different program to edit or press the PROGRAM EDIT key to deactivate *edit mode*. The PROGRAM EDIT LED will toggle "off". The PROGRAM number and CUE number *up* and *down* arrow keys will be disabled and the displays will slowly blink if the show is in progress.

Following are some simple rules to remember when programming:

- 1) Programming a SHOW END cue locks out subsequent cue numbers, keeping you from scrolling to a larger cue number.
- 2) You may edit any program while a show is in progress (including the program that is running).
- 3) When a show is in progress and you are *not* in the PROGRAM EDIT mode the PROGRAM and CUE number *up* and *down* arrow keys are disabled.
- 4) Use of HOST PC and software will provide the most user-friendly interface to the CNA-100 as well as provide access to multiple options not available through the keypad and 7 segment display interface on the front panel.

Pressing the STOP and START keys simultaneously will escape a running show, this can be used while troubleshooting or installing the system.

The INTERMISSION and CURTAIN CALL Keys

These are two special programming keys that allow the user to easily program a Show Intermission and a Curtain Call. The INTERMISSION KEY is used to program a show intermission at the selected cue. The cue then initiates the intermission sequence as follows:

Changeover Close
Lights
Sound
Curtain Close

7 second delay

Xenon Lamp Off
Projector Motor Off
Slide Projector On

The Intermission is terminated and the show is re-started either by a START input (remote or local) or a CUE input (remote or local). If the show is re-started by a START input, only the projector motor and lamp are turned on. The next film cue will initiate the show start sequence. The show start sequence is as follows:

START

Xenon Lamp On
Projector Motor On

Cue n

Lens/Masking
Lights
Curtain Open

7 second delay

Slide Projector Off

1 second delay

Changeover Open
Sound

If the show is re-started with a CUE input, there is *no* need for a show start cue. The show start sequence is as follows:

```

CUE
-----
Xenon Lamp On
Projector Motor On
Lens/Masking
Lights
Curtain Open
-----
7 second delay
-----
Slide Projector Off
-----
1 second delay
-----
Changeover Open
Sound

```

The "Curtain Call" function will issue a curtain *close* at a selected cue. For example, suppose you wanted your curtains to close and the end of your trailers and open back up at the start of your feature presentation. You would place a cue at a distance before the end of the trailer that is equal to the curtain close time and another cue at the beginning of the feature. The sequence of events are as follows:

```

Cue n (with Curtain Call)
-----
Curtain Close
Sound (if programmed)
Lights (if programmed)
-----
Cue n+1
-----
Lens/Masking
Changeover Close
Lights
Curtain Open
-----
7 second delay
-----
Changeover Open
Sound

```

Operating the CNA-100

In the "Ready to Run" state, the FILM PRESENCE LED will be "off", and the START LED will be blinking. Select the program 1 through 9, that you want to run with the up/down arrow keys. Press the START switch to start the show. The START LED will toggle "on".

When a show is running, the current states of the Sound, Lens, Lights and Auxiliary will be shown with the LEDs "on". The cue number displayed is the next cue the CNA-100 is waiting to see.

Soft Manual Overrides

During run mode, pressing any of the Sound, Lens, Lights or Auxiliary keys will drive the output to that state. Note: This will not alter the saved program. At the next cue the program will override any manual changes. This option is only available when the internal DIP switches are configured to allow soft overrides.

Synchronous Operation

The CNA-100 systems are capable of running film synchronously in a multi-projector booth. The CNA-100 can be programmed for any one of nine sync loops. This allows for up to nine different sync loops on the network at one time. Pressing the SYNC key will activate the sync operation and disable the up/down arrow keys. (This prevents the machine from joining another sync loop that may be running and causing a fault on those machines when it drops off the loop.) To change the SYNC LOOP number, press the SYNC switch to deactivate. Set the loop number with the up and down arrow keys and press the SYNC switch again to activate. The LED on the SYNC switch indicates whether sync mode is active or not.

To run in sync the following conditions must be true:

1. A *sync cue* must be added to the beginning of the film. This is the first cue that is seen by the automation. It acts to initiate the start up sequence for each machine.
2. Sync Mode on each automation in the loop must be enabled.
3. The sync loop number on each automation in the loop must be the same.

To begin a movie, insure that the sync cue is positioned somewhere before the cue detector on the first machine. Press the [START] switch on any machine in the loop. All projectors will start simultaneously. As the sync cue passes through each projector, the show start sequence will initiate.

At the end of the show each machine will shut down independently as the tail of the film runs out of the projector. On endless loop systems all projectors will continue to run until the last machine sees the end cue. At that time all projectors will shut down simultaneously.

System Status Messages

The CNA-100 contains a list of status messages that can be displayed due to various internal or external conditions. Most of these messages displayed indicate system faults. There are also some internal power up and reset diagnostic messages, most of which will not and should not be displayed under normal operating conditions.

Fault Condition Messages

The Fault Condition messages can be divided into three categories: Internal *memory* faults, *run-time* faults and *failsafe* faults.

Memory Faults

The internal memory faults are generated when there is a "checksum" error. Briefly, a checksum is an arithmetic sum of the contents of memory that is stored in the memory itself and is re-computed and checked each time the CNA-100 is powered up. Each of the Programs (1 through 9) and the System Parameters have a checksum. The fault messages are displayed and "blinked" rapidly on the three digital displays.

<u>Message</u>	<u>Description</u>
P 0 1	Program 1 Checksum Fault
P 0 2	Program 2 Checksum Fault
P 0 3	Program 3 Checksum Fault
P 0 4	Program 4 Checksum Fault
P 0 5	Program 5 Checksum Fault
P 0 6	Program 6 Checksum Fault
P 0 7	Program 7 Checksum Fault
P 0 8	Program 8 Checksum Fault
P 0 9	Program 9 Checksum Fault
P A r	System Parameters Checksum Fault

If any of the *Program* memory faults are displayed on power up, *clear* the fault by pressing the ALARM CANCEL key. Press the PROGRAM EDIT key to enter the edit mode. Cursor to the program that has the checksum error. Scroll through the program to verify it. If all the steps look okay, press any key to re-calculate the checksum. Press the PROGRAM EDIT key again and cycle power to verify that there are no other checksum errors.

A *System Parameters* memory fault will be displayed if there is a checksum error. This error must be cleared from the *Host PC*, by copying the system parameters from the Host Program to the CNA-100. If you are not using a Host PC, the system will be using the *default* parameters and can not issue a System Parameters Checksum Fault.

Run-Time Faults

These three messages will be displayed if there are the following communications faults.

<u>Message</u>	<u>Description</u>
L I n	Local I/O Network Fault
L S I	Local Sync Interlock Fault
L S C	Local Sync Communications Timeout Fault

The Local I/O Network Fault is caused due to a loss in communications with a Local I/O Network device or another network problem. This could be the Booth Termination Panel, Console Termination Panel or other I/O Network device or a wiring problem.

A Local I/O Network fault will cause the CNA-100 to display "L I n". This fault will cause a shutdown during a show or prevent a show start between shows. This fault is latched and you are required to press the ALARM CANCEL key to clear the fault. Although this will cancel the fault and allow a show to start, there is a problem with the Local I/O Network or one of the devices and it must be repaired.

A Local Sync Interlock Fault is caused when either a master or one of the slaves in the sync loop has lost its sync input (sync switch). All CNA-100s on the sync loop will display "L S I" and sound their alarms. This message will also be displayed if one of the units on the loop had a "watchdog reset". If this was the case, all units will display this message except for the one that had the watchdog reset.

A Local Sync Communications Fault is caused when there is a loss of communications with a unit on the sync loop. This could be due to a loss of power of the master or one of the slaves on the loop. In this case all units on the sync loop would display "L S C" except for the one that lost its power. This fault can also be caused by defective wiring, such as an open or short on the LSN communications link.

Sync Interlock Failsafe Fault

This fault indicates the master or one of the slave CNA-100s has a failsafe fault that is preventing the interlock loop from *resuming* a show. The following message is displayed to indicate this fault.

<u>Message</u>	<u>Description</u>
L S r	Not Ready To Resume Fault
L S r	Need Master To Resume Fault
L S r	Not Ready To Run

The Not Ready To Resume Fault indicates that the automation cannot start a show because a least one of the CNA-100 remotes are not in the “Ready to Resume” condition.

The Need Master To Resume Fault indicates that there is no master. The master may be lost if the communication wires are disconnected, power is lost or the sync input (sync switch) is not enabled at the master.

The Not Ready To Run Fault indicates that the automation cannot start a show because a least one of the CNA-100 remotes are not in the “Ready to Run” condition

Event and Show Logs

When running Host software the CNA-100 is capable of sending data over the LSN to a Host PC. This is a historical record of automation activity including faults, starts, stops, cues and other occurrences. Show logs contain data specifically about a particular show, this data can include show numbers, events and times that the events occurred, total down time, and many other important parameters. See the Host manual for more information on event and show logs.

Program and Configuration Copy Functions

The Host software package allows the user to copy individual programs and configuration details from and to your CNA-100. Due to limitations set by the front panel’s attributes, the Host package must be used to access these functions.

Supervisory

Supervisory configuration is only accessible via the Host program, system variables such as lighting levels for the QDC-400 and sound configuration on the RVC-5, as well as system settings including Delays, password, and output configurations can all be set up here. See the Host user guide for further information on these functions.

Power Up Messages

Upon power up, the CNA-100 will display a series of messages. The following messages should be displayed at power up:

<u>Message</u>	<u>Description</u>
2 1 5	Version Number (2 seconds)
1 0 5	Checksum Number (2 seconds)
P U P	Power Up Reset (2 seconds)

These messages will be displayed in this order each time the CNA-100 is powered up. Each message is displayed for about 2 seconds. The first message is the software version number (version 2.15). The second is the software checksum number, and the last message indicates to the user that it is a power up condition.

Additional Software

CineNet Host Software Package

The CNA-100 automation is optimally configured and used with the CineNet HOST software package. The Host program allows setup, data transfer and programming in a user-friendly format. Additional hardware and software is required. First there must be a Host Computer, this can be any DOS-based PC with either 1 free ISA slot or an RS-232 Serial port that is not in use, installed on that PC there must be CineNet Host networking software. This software allows the PC to interface with the CNA. The only additional piece of hardware required is a network controller. This can be in the form of a ISA card installed in the PC, or a convenient external package such as the VNC or PCI-64 network interface.

See the CineNet HOST user manual for further details on installation.

Host software provides Event logging, both LIN and LSN Network status, configuration, and programming/ copy functions as described in previous sections.

CineSuite Software Package

The CineSuite software package is a more advanced version of HOST software including three software applications:

CineSuite Manager: This is the main user interface. When creating CNA programs, settings CNA supervisory functions or monitoring CNA operations, this is the application that will be used.

CineSuite Router: The CineSuite Router is used to manage traffic between the various CineSuite applications. Users only need to set the client application to point to the computer that has the CineSuite router running and it can then communicate with all other clients connected to the same router.

CineNet Driver: This is the software application that connects the CNA Gateway and automations to the computer.

The CineSuite software operates over TCP/IP communications protocol meaning that it can be used in conjunction with the internet via a modem or any ethernet connection. It allows remote access to the automation network and provides a means of remotely monitoring devices on the LIN.

CineSuite Reporter software has a full color interface for quick identification of remote problems. Reporter can also email status reports managerial personnel and generate reports over long periods of time in order to quantify efficiency in staff and equipment.

CineSuite similarly requires a Host PC and a hardware interface device. The Host PC must be at least a 486/66Mhz running windows 95 or above. The CineSuite package is constantly under development with new features being added regularly. See the CineSuite Guide for additional information.

Timing Diagrams for the CNA-100

The following Timing Diagrams show timer values, output configurations and cue events for all the outputs. **Timers and output configurations such as pulsed/maintained, power up and fault conditions are defaulted on the CNA-100, and can only be changed with the Host Program.** These timing diagrams can be extremely useful to help understand the operation and capabilities of the CNA-100. The first timing diagram shows the “Standard Operation” from power up to show end. Standard Operation implies a running a program with no interruptions (stop or faults) or special effects (curtain call or intermission). The defaults for each outputs are indicated in the last column of the timing diagram. Default timer values and pulse durations are indicated in the bottom margin of the timing diagram. The diagram indicates automatic and programmed outputs.

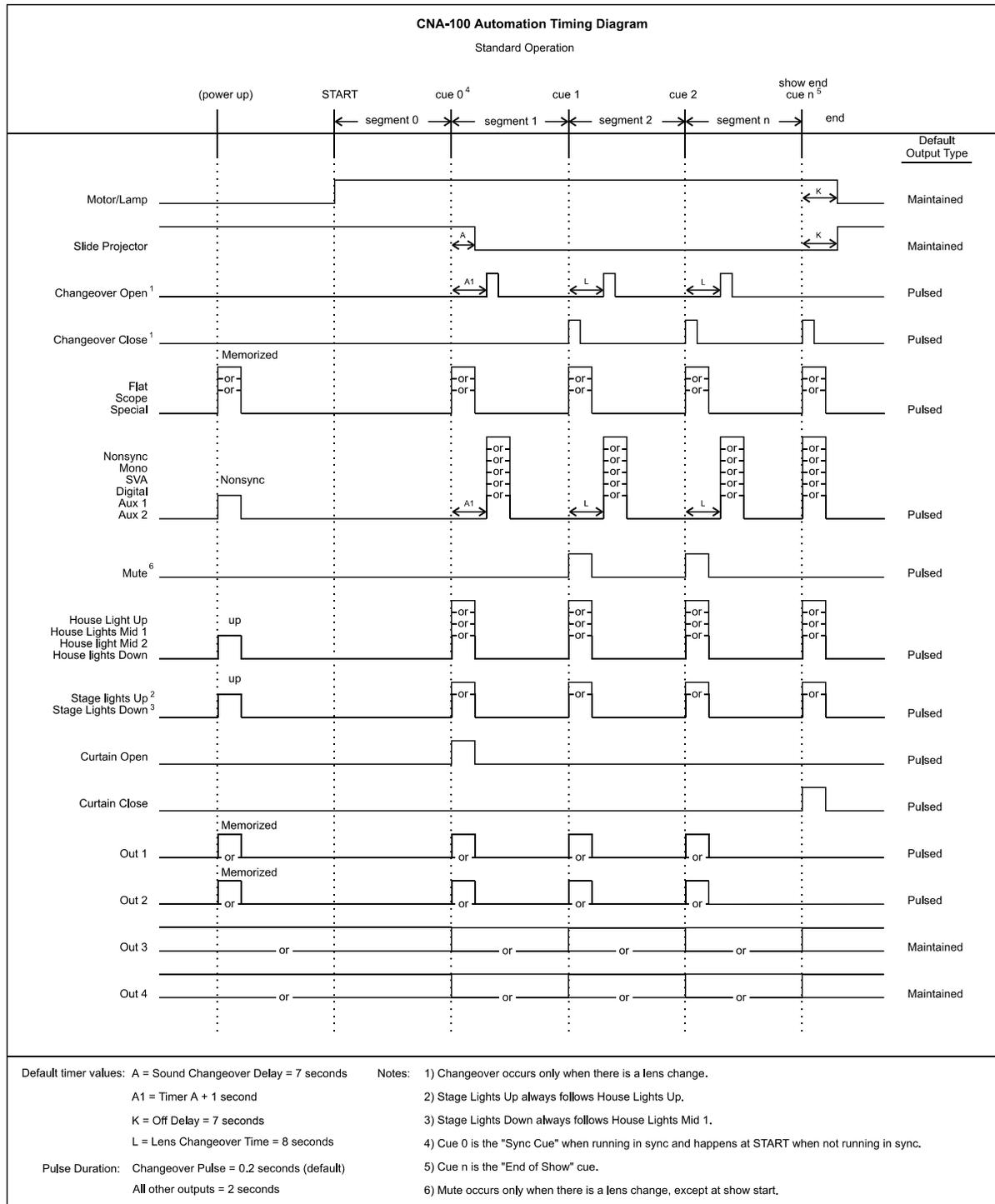
The second timing diagram shows the Fault/Stop Shutdown and Restart Sequence. The area of interest is the shaded portion of the diagram. This shows the default ‘Fault-to’ conditions:

Projector Motor and Lamp = OFF
Slide Projector = ON
Changeover = CLOSE
Sound = NON-SYNC
House Lights = UP
Stage Lights = UP

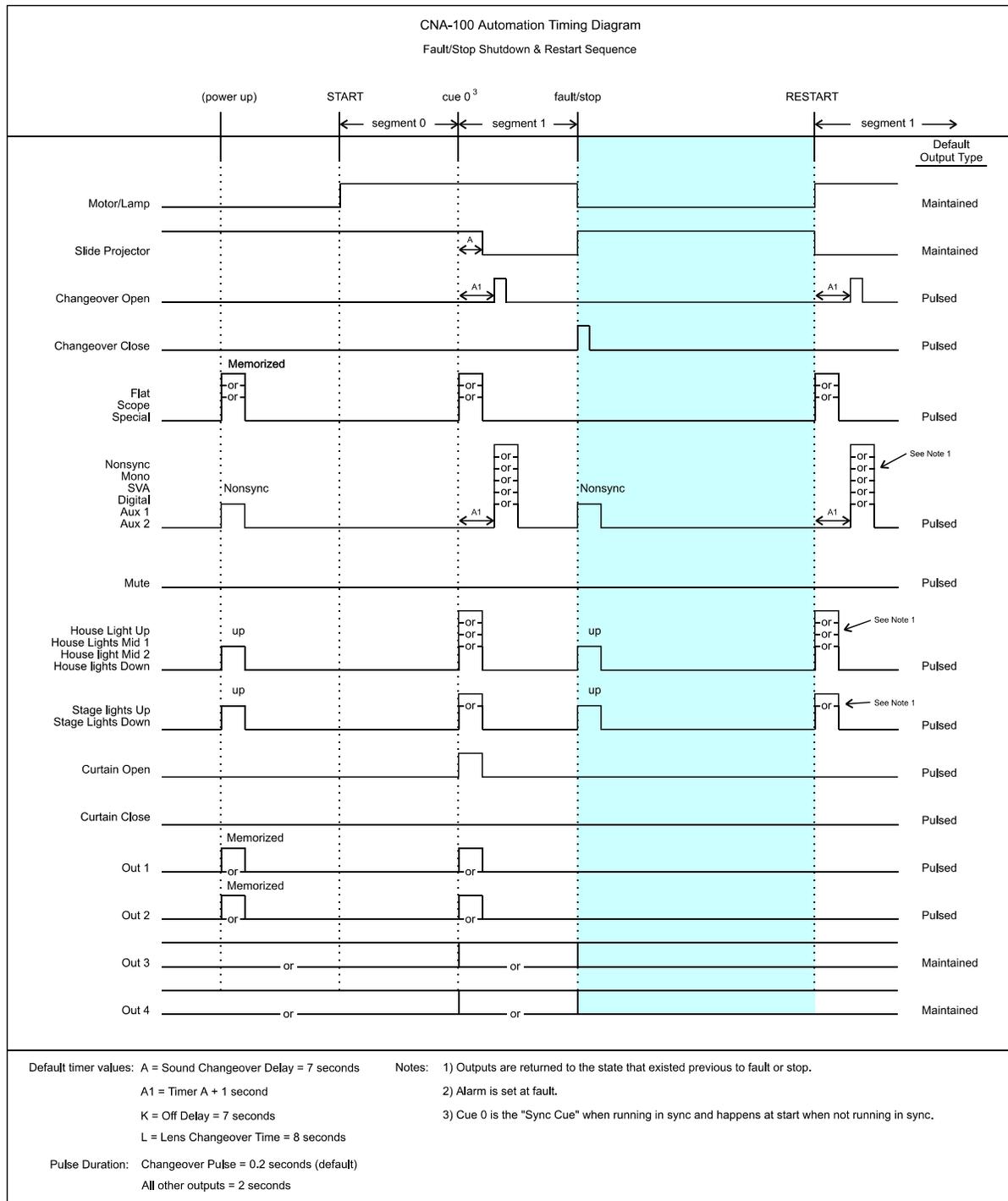
These default conditions can be configured in the CNA-100 Set-up Supervisory section of the Host PC Program.

The third timing diagram shows the Intermission Stop Sequence. The area of interest is the shaded portion of the diagram. At the Intermission cue the Changeover and Curtain will close. Seven seconds later the Projector Motor will shut off and the Slide Projector will turn on. Sound, Lights and Out 1, 2, 3, and 4 can be programmed for any state during the intermission. A Restart will start the Projector Motor and a film cue will initiate the show start sequence.

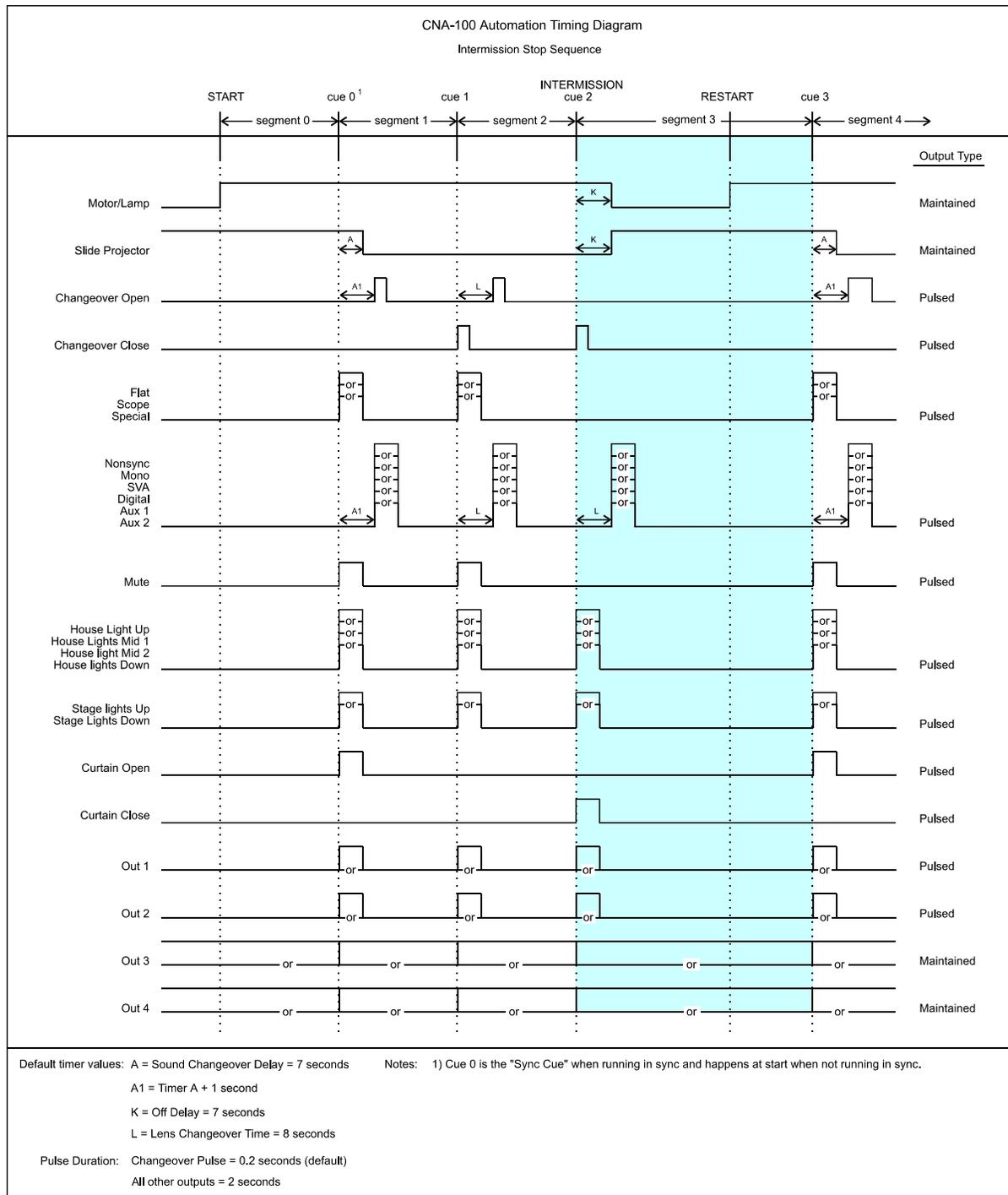
The last timing diagram shows the Curtain Call Sequence. The area of interest is the shaded portion of the diagram. At the Curtain Call cue, the curtain begins to close. The ‘next’ cue will begin to open the curtain. The ‘curtain close time’ is determined by the distance between the curtain call cue and the next film cue. Sound, Lights and Out 1, 2, 3, and 4 can be programmed for any state during the Curtain Call.



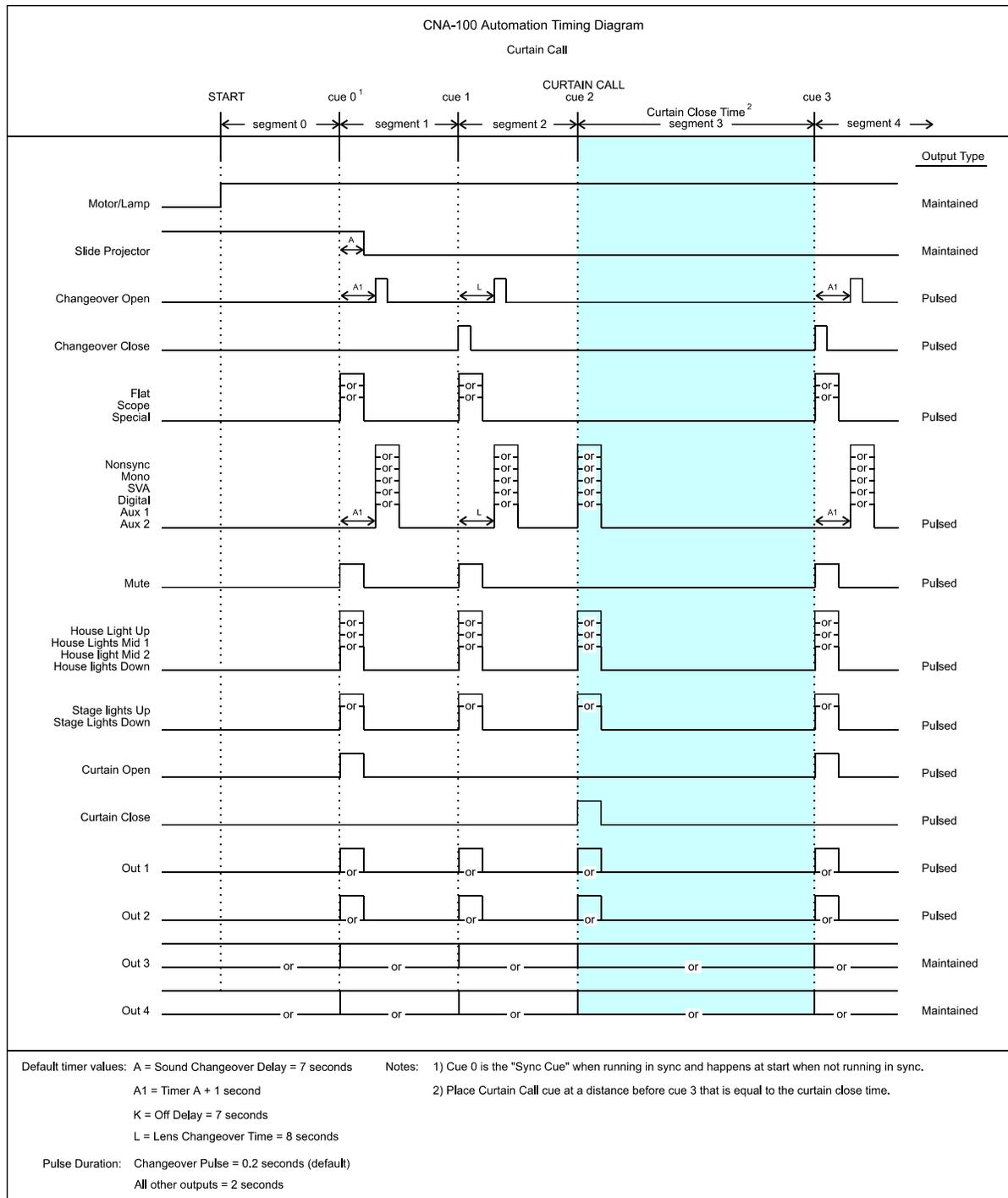
Timing Diagram 1



Timing Diagram 2



Timing Diagram 3



Timing Diagram 4

Addendum

Software Changes

This section details the CNA-100 software changes.

Version: 1.05
Checksum: 210
Date: 7/15/97

This version requires Host V1.003 and is compatible with CNA-200 V1.006.

1. Aux Output on Console Termination Board now follows "Slide Projector" output.
2. Lens and Masking now support programmable "Power Up" default.
3. I/O Communications now "re-sends" setup data to I/O devices when System Parameters is updated. (Sound C/O Pulse time.)
4. Added "(t)" and "©" to Sync protocol to indicate "Timed" or "Clock" Start mode.
5. Stop key now works the same everywhere - forcing switch to "Show Hold" mode (to other controls).
6. Added "Check Focus" beep to indicate Clock Start or Timed Start from another control.

Version: 1.06
Checksum: 216
Date: 9/17/97

This version requires Host V1.004 and is compatible with CNA-200 V1.007.

1. Added support for newly designed MCD-35 Cue Detector for Local I/O Network (LIN).
Note the CNA software "Auto Detects" the MCD-35 the first time it responds to a poll. Once this board is detected the "Motion" and "Presence" inputs on the Console Board are then ignored. It would be a good idea to leave the Console Board inputs "open" rather than "shorted" to cause a fault in the event that the MCD-35 board does not respond to polls on power up. (Not a requirement, just a suggestion...)
2. Increased Motion Fault time from 2 seconds to 3 seconds.

Version: 1.07
Checksum: 23
Date: 2/02/97

This version is compatible with CNA-200 V1.009.

1. Added S2-2 "Enhanced Curtain Call" DIP switch configuration.
2. Added S2-3 "Run til End of Film" DIP switch configuration.
3. Added "Resume-bypass" of the Sound Changeover Delay. The Sound Changeover Delay is now bypassed for a Resume.
4. Data Entry now shows "next state" of program.

Version: 1.08
Checksum: 103
Date: 10/16/98

This version requires Host V1.005 and is compatible with CNA-200 V1.011.

1. Added LIN communications support for new ACP-50 Auxiliary Control Panel device. Added support for ACP-50 Volume & Mute Keys. Volume keys are however disabled for this version pending the development of the remote volume control.
2. Selecting new sound formats now clears the new "Mute" flag.
3. Sound and Lens now pulse when set to the "same" state again.
4. Added Fire Stop Option Dip switch:
S2-4 OFF = Normal Stop, ON = Fire Stop

This new "Fire Stop" option:

- a. Stops the Show,
- b. Forces Sound to Mute,
- c. Forces Console Slide Projector off,
- d. Forces Booth Slide Projector On (new fire stop output).
- e. Forces all other outputs to their "Fault To" state.

When S2-4 is Configured for "normal" operation both Slide Projector outputs perform the "Slide Projector" function and the Remote Stop simply stops the show if it is in progress (both same as in previous version).

5. Check Focus Alarm now only follows others on our SYNC loop if our SYNC switch is enabled.

Version: 2.00
Checksum: 244
Date: 2/7/99

Compatible with Host V.1.06, older versions of CNA 100 firmware, & CNA-200 V1.011.

New firmware auto-detects CNA-100/ 150 front panel, *same firmware now resides in both the CNA-100 and CNA-150*

Added demonstration data entry support for QDC-400, there is no control or communications support implemented however

Version: 2.01
Checksum
Date: 3/4/99

Compatible with Older CNA-100 Firmware, CNA-150 V2.00, CNA-200 V1.011 QDC-400 V2 Host V1.06

Made internal software changes.

Version: 2.02
Checksum:
Date: 4/27/99

Compatible with older CNA-100, CNA-150 V2.02, CNA-200 V1.011, QDC V3 Dimmer Setup now allows 0-99 Seconds (Previous version allowed 0-60)

Version: 2.03
Checksum: 120
Date: 6/22/99

Compatible with Host 1.007, Older CNA-100 firmware, CNA-150 V2.03, CNA-200 V1.013

Unit now supports 4 QDC-400 Dimmer controls.

Added Cue Learn (manual/ auto/ disabled) flag (CNA-150 only).

Added timed start function (CNA-150 only).

Added Network copy programs and learn times w/ supervisory setup(CNA-150 only).

Menu system restructured for CNA-150

Enabled SW2-6 Check focus delay function for timed start, on=enabled,

Off=disabled

“Show End” LED blinks when waiting for cue 9

Version: 2.04**Checksum:****Date: 8/23/99**

Compatible with Host V1.007, Older CNA-100 versions, CNA-150 V2.040, CNA-200 V1.014, RVC10 V1, QDC-400 V3+4

Added event logging via SW2-7 (on=enabled, off=disabled)

Added measurement of "Unscheduled Down Time". This is simply the number of seconds that a show is stopped due to a Major Fault or by Manual "Stop" (key or input).

Version: 2.05**Checksum: 50****Date: 2/4/2000**

Compatible with Host V1.010, Older CNA-100 firmware (V1.08), CNA-200 V1.016, QDC-400 V3+4.

Added support for Flash updates through Host SW1-1 Now forces Bootloader in the event of RTOS failure.

Added "remote reset" power up message for occasions where a remote reset is invoked.

Version: 2.06**Checksum:****Date: 5/11/2000**

Compatible with Host V1.010, Older CNA-100 firmware (V1.08), CNA-200 V1.016, QDC-400 V3+4.

-Improved keypad cue input functionality, (end segment "MEND" now latches keyboard cues "ICUEKL" for more dependable operation)

-Moved sound and lights default code to the start stop key abort logic and removed it from the DRMABT routine. This prevents Show start from forcing House and Staged lights up and sound to Non-sync when waiting for Cue 0.

Version: 2.07**Checksum: 120****Date: 6/28/2000**

Compatible with Host V1.011, Older CNA-100 firmware (V1.08), CNA-200 V1.019, QDC-400 V3+4.

Added support for new "FIRESTOP" input bit from RCM10 V2.020 Sync flags. Compatibility and functionality are described below. Note that "Remote Stop" and "Fire Stop" are two different functions:

RCM10 V2.01 -Estop input asserts Remote Stop to each of it's 10 CNA's
(Causes "normal" shutdown in all CNA's.)

RCM10 V2.02 -Estop input asserts Remote Stop to each of it's 10
CNA's.(Causes "normal" shutdown in all older CNA's.) In addition a new (spare)
bit is also asserted which is defined as "FIRESTOP".
(Causing "FireStop Faults in all newer CNA's.)

CNA-200 V1.018 -If ESTOP is asserted at the RMC10 (V2.01 or V2.02) the
CNA-200 performs a normal "REMOTE STOP".

CNA-200 V1.019 -If ESTOP is asserted at an RMC10 V2.01 the CNA-200
performs a normal "REMOTE STOP".

-If ESTOP is asserted at an RMC10 V2.02 the CNA-200 asserts it's FireStop
Fault.

All combinations are compatible - you will either get the "old" operation or the
"new" operation. To get the "new" operation, you need to update both the RCM
and the CNA software.

Note the SW2-4 operation is unchanged in this software release - it is simply
restated here for convenience since there is now an additional input that can set
the Fire Stop Fault.

Version: 2.08

Checksum:

Date: 6/8/2001

Fixed scan related "blip" on Non-sync output when Fire Stop input was asserted.

Version: 2.09

Checksum: 12

Date: 9/25/2002

Added support for Kodak Content Player (Network 2) on the existing Debug Port
(P6).

This Kodak Content Player feature is Enabled/Disabled with DIP Switch 2 bit-8.
All Manual Start Inputs (including the new one from Kodak) now support the
"Check Focus" delay. See DIP Switch 2 bit-3.

Added the following new Error Messages:

"CAI COM TIMEOUT"

"CP COM TIMEOUT"

"CP NOT IN AUTO"

"CP NOT READY"

Version: 2.10
Checksum: 12
Date: 10/31/2002

Made internal improvement with “firestop” input function. (Fire Stop Fault logic (FIRESF) now always sets the mute flag (VMUTEF)).

Version: 2.11
Checksum: 50
Date: 1/16/2003

Added SW3-1 configuration to enable "Program Edit Key Password" logic.

SW3-1:
ON "Program Edit Key Password" required.
OFF "Program Edit Key Password" is not required.

When configured with "SW3-1 ON", the software supports both the original "Edit" mode and a new "View Only" mode.

The "View Only" mode is indicated by the "Program Edit LED" blinking.

This new mode allows the Feature Programs to be viewed by anyone. However, changing programs (may) now require entering the correct password.

Version: 2.12
Checksum:24
Date 5/16/2003

Added CLINK2TMR to prevent erroneous "CAI COMMUNICATIONS TIMEOUT" error messages.

Version: 2.13
Checksum: 248
Date: 10/21/2003

Added “chksys” logic to data entry save of system parameters eliminating unnecessary LIN traffic. Where updates are only performed when data changes
Added support for new QDC v7 Optional front panel.
Screens that edit system parameter data are aborted by communications if system parameter is received from a QDC board. This applies to the following screens:
setup CNA system and Setup dimmer.

Added support for QDC overrides from boards 2-4.
Changed power up logic to now finish move to save system parameters from the QDC update if it was interrupted by a power failure.

Version: 2.14
Checksum: 50
Date 4/20/2004

HDLCs no longer clears HOSTUP flag. (made the CNA request Host ID and then Send machine status via LSN
Reworked software to prevent unwanted watchdog tripping when debugging.
Added Support for RVC-5, “3-sound” in supervisory, “3-sound programs” to set-up menu, and “3-sound level” to control menu.
Enhanced support for ACP 50 volume keys and display.
The rising edge of firestop fault logic now forces house and stage lights bright. This lets the overrides function as expected. Previously the lights were not forced bright if a fault was present.

Version: 2.15
Checksum: 105
Date 1/ 19/ 2005

- 1- Made password dip switch software configurable via the host program. Note that the latest version of host is also required.
- 2- SW 3-6 enables/ disables the RSM-10/ RCM-10's “Check Focus Delay” alarm. Off enabled and On is disabled
- 3- Added programmable power up states for masking and Sound.
Added programmable Fault to settings for: Lens, Masking, Sound, House lights, and Stage Lights. These are defined through the host program.
Made the CNA-100 more like the CNA-200 by reworking the feature start time routine. Reworked the Call to log automatic Cue 0 event.

Bootloader Changes:

Date: 2/4/2000
Version: 1.000
Checksum: 40157 (Base 10)

Initial bootloader used in CNA system.

1. Created this Boot Loader Program to load the following programs into FLASH:

CNA-100 V2.05
CNA-150 V3.050
CNA-200 V1.016
2. This program uses LSN Network Device Type = 4 (CNABOOT).
3. Now supports LSN FLASH update Network commands (\$40 to \$43).

Date: 5/9/2000
Version: 1.001
Checksum: 44570 (Base 10)

1. Moved "LDY #SWAPCNT" up 3 lines in Calculate Checksum routine (CALCPCHK) to increase the rate the watchdog is toggled. Should not have been a problem.
2. Now toggles watchdog in FL_PROGBK routine since a byte write may take as long as 60 milliseconds

Date: 9/16/2002
Version: 1.010
Checksum: 44558 (Base 10)

Latest versions at this time:

CNA-100 V2.09
CNA-150 V3.090
CNA-200 V1.022

1. Changed "CPE SAVEP,Z" to "CPE 0,X" in FL_PROG routine to correctly test for "POSSIBLE TIMEOUT OR JUST WENT DONE". The previous logic might report a write as failed. The logic must be currently taking the earlier branches - Since there were no reports of this failure from the field at this time.

Date:10/7/2002
Version: 1.020
Checksum: 61822 (Base 10) \$F17E

Latest versions at this time:

CNA-100 V2.09
CNA-150 V3.090
CNA-200 V1.022

1. Rewrote FL_ERASE routine. The original interpretation of the multiple sector erase sequence was wrong - but worked with the FLASH parts at that time ("non-lettered": AM29F010). However the new parts ("lettered" AM29F010B) no longer accept this interpretation. Basically, the "unlock" portion of the command should only be issued once, then within 50 microseconds write the Sector Erase command (\$30) to multiple sectors.
2. Reworked the comments for FL_ERASE - Indicating it should only be used to erase a single sector.
3. Moved call to "PROTFY" in main loop down a few lines from just after "JSR FL_ERASE" to just after "JSR FL_WAITE". I don't think this was a problem, since this program runs in ram. This change should now let the "FL_ERASE" routine correctly perform the FLASH Reset function if it is ever necessary.
4. Increased FLASH erase timeout from 15 to 20 seconds.

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CNA-100 Parts List:

Below is a listing of the major components that make up the CNA-100, the technician or theatre manager may find it useful when ordering replacement parts in the event of an automation component failure.

Description	OEM#	Strong#
CNA-100 Display interface board	29326	5172009
CNA-100 CPU Mainboard	39325	5172008
CNA-100 Replacement Overlay w/ Front panel	39310-1	-NA-
CNA Power supply	39328	5198304
CNA Replacement power transformer	64011	-NA-
CNA-100 Wall-Mount Replacement Overlay w/ Front panel	39313W-1	-NA-
DPST Rocker Switch, Power and Overrides	39336	-NA-
SPDT Rocker Switch, Overrides	39337	-NA-
SPDT Rocker Switch, Overrides	39338	-NA-

Note: Other specific parts available upon request, contact Strong International for assistance.