

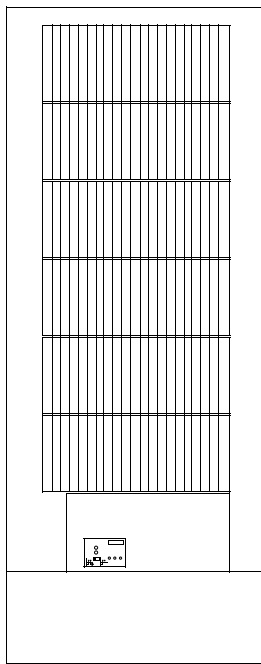
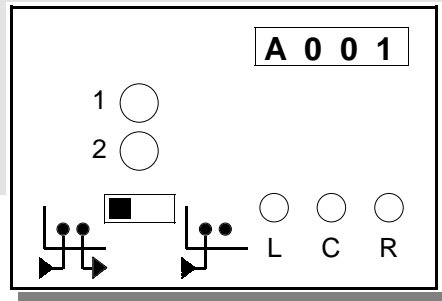
IPS Dimmer Strips DS-1206 ... DS-2403 ...  
Dimmer Boxes DB-1206 ... DB-2403 ... DB-NOMAD ...  
Dimmer Panels DR-2406 ...  
Relay Switching Strips RS-1206 ...

Different configurations...

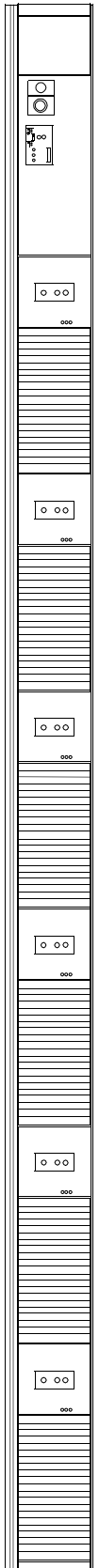
Various applications...


ONE communications manager...

# The IPS Head-End Processor



A Field Service Guide  
Navigating the Menus  
Understanding the Displays  
Configuring an IPS Dimmer System





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Senior Electronics Technician  
Field Service Manager

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# Introduction

## Exclusive Use

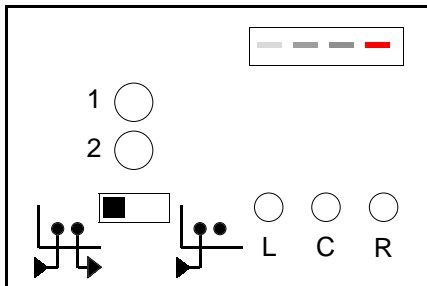
This guide is intended for the exclusive use of Rosco/Entertainment Technology Authorized Field Service Personnel.

## Format

This guide begins with a basic description of the IPS Head-End Processor and what to look for when power is first applied to it. From there, each menu and its function is thoroughly described in order of its appearance on the display.

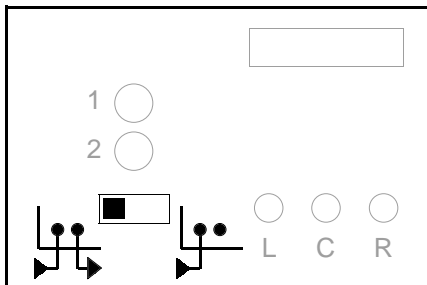
Finally, the hidden *factory maintenance* menus are revealed and their functions are also explained in order of their appearance on the display.

## Diagrams



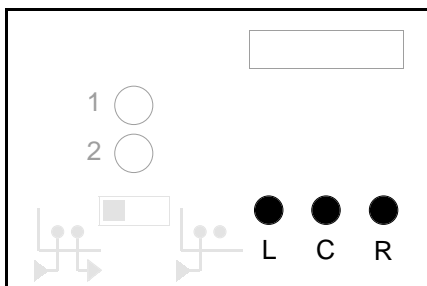
The diagram on the left represents the Head-End display and interface section that is common to all IPS Dimmer Strips, Boxes and Panels.

This diagram will be repeated through-out this guide to help with reading and navigating the menus.



This diagram highlights the control signal termination switch. This switch should be set to the left for “pass-thru” unless the Head-End is at the end of the run (only one control cable is plugged into the unit) then the switch should be set to the right. Terminating does not prevent the signal from passing through the Head-End, it only serves to introduce resistors into the path to prevent signal reflection.

Note: The control signal is hard wired across the Head-End’s input and output circuitry. The Head-End does not require power in order for the control signal to pass through.



This diagram highlights the three buttons that are used for navigating and programming the Head-End.

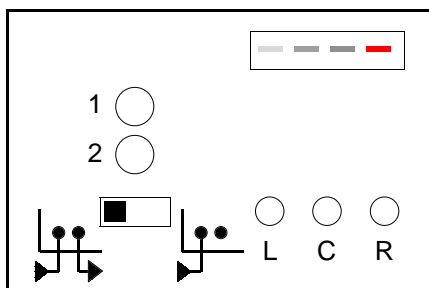
By the way, the answer to a frequently asked question...

**Left   Center   Right**

# Head-End Processor Basics

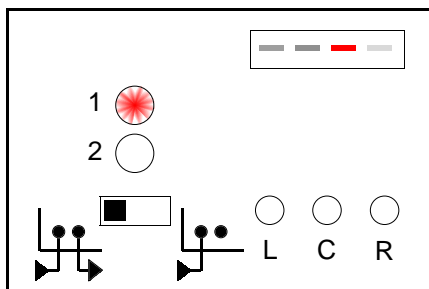
## Basic Concepts

The Head-End Processor is the communications manager for the IPS dimmer system. It receives the DMX512 data stream, determines which portion of the data is applicable and then instructs the dimmers to go to output levels accordingly. It checks the dimmers for operating status and makes this data available both on the local 4-digit display and over the DMX512 network. It accepts control input from its three push buttons to allow operating modes to be selected and data to be displayed.



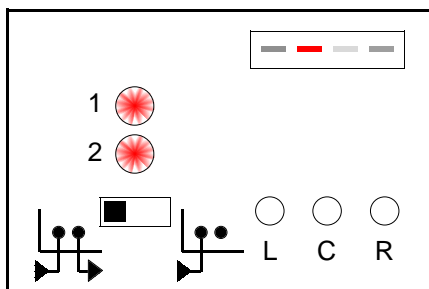
### Normal State

The 4-digit display is the primary indicator of the Head-End operating state. During normal operation it displays a dash “-” character which repeatedly marches across the digit positions. Head-End menus are selected with the “L” button and are indicated by letter or number codes on the display. No matter what menu is selected, the Head-End will automatically return to the “Normal” state after approximately 2 minutes.



### Special Conditions

The two individual LEDs (1 and 2) are used to indicate special conditions. LED 1 indicates that a DMX512 or AMX192 data stream is not present. Without a control signal present, an inactive IPS unit will go into Low Power Mode, during which time the user will notice not only the marching hyphen display and LED 1, but also every dimmer within the unit will simultaneously flash a red LED at 22 second intervals.



LEDs 1 and 2 indicate that the IPS unit is in Power Up Preset Mode. This will only occur if all three of the following conditions are met:

- The IPS unit has just powered-up.
- There is no control signal present (console off).
- The IPS unit had an internal preset selected for playback.

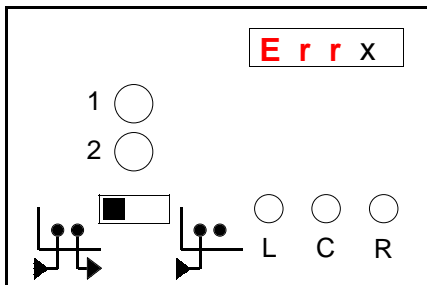
## Setting Dimmer Parameters

All parameters which may be set in the Head-End menus may also be set by a command data stream on the DMX512 network. Refer to your controller's Users Guide for information on the remote setting of IPS Dimmer System parameters.

# Head-End Processor Basics

## Diagnostic Error Report

When power is initially applied to IPS, it conducts a series of diagnostic tests. The results are reported by the following display.



**E r r** = Menu indicator.  
**x** = Error code. (1-7)

### Operation:

**L** Button: Change to "Display/Set Address" menu.  
**C** Button: No action.  
**R** Button: No action.

This display will appear immediately after unit power-up only if a significant error or anomaly is detected. It is displayed for one minute, or until the "L" button is pressed.

The last digit of the display denotes the error condition, as follows:

- E r r 1** Head-End ROM checksum error. EPROM may require replacement.
- E r r 2** EEPROM was blank or invalid and has been reinitialized. Any user programmable features in this IPS unit, including address, will require resetting. If error persists, the EEPROM may require replacement.
- E r r 3** One or more dimmers are absent or not responding. Check for proper power on all phases entering the IPS unit and/or any dimmer with its red LED glowing.
- E r r 4** 3-Dimmer version of Head-End EPROM is installed in a 6-Dimmer unit.
- E r r 5** Head-End and dimmers are not all configured for the same voltage. This may indicate that there is a mix of 120V and 240V dimmers in the unit.
- E r r 6** One or more dimmers have reported a fatal error.
- E r r 7** Unit is miswired to high voltage. Check AC line into IPS unit!

## Head-End Differences

Although IPS Head-End circuit cards appear to be identical between various products, be aware that some differences do exist. In addition to the list below, go to page 13 for more information.

**120V or 240V Operation** The ONLY difference between a 120V and 240V version of the circuit board is whether or not a jumper is located across "J1". NO JUMPER = 120V. Jumper = 240V.

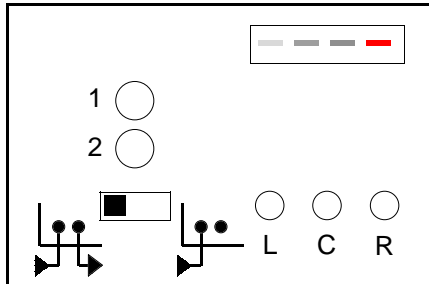
**Convection Cooled Dimmers** These Head-Ends are interchangeable except for EPROM "firmware." See page 13 for details regarding proper software versions.

**Fan Cooled Dimmers** These Head-Ends are identical to Convection Cooled except for a jumper across "J2", plus additional components to control fan operation.

# Head-End Processor Menus

## Normal

A marching hyphen moves across the display. This is the state that the dimmer system will maintain during normal remote control operation. No matter what menu is selected, the Head-End will automatically return to the "Normal" state after approximately 2 minutes.

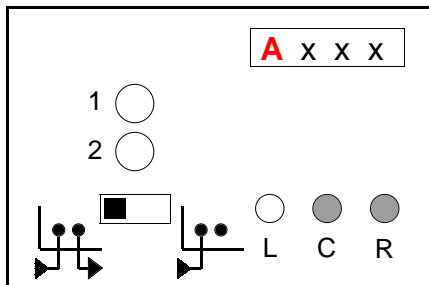


### Operation:

- L** Button: Change to "Display/Set Address" menu.
- C** Button: No action.
- R** Button: No action.

## Display/Set Address

This menu allows the network address of the first dimmer in the unit to be examined and set. Only the start address requires setting. As soon as the desired start address is displayed, the Head-End automatically stores it and assigns addresses to the remaining dimmers in the unit.



**A** = Menu indicator.

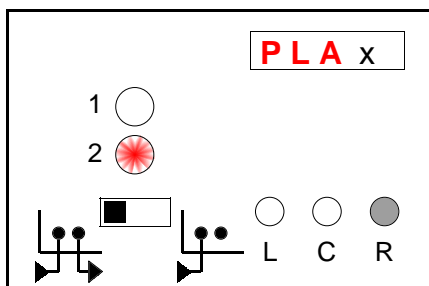
x x x = Start address in decimal. (001-511)

### Operation:

- L** Button: Change to "Playback Preset" menu.
- C** Button: Increase address by 3.
- R** Button: Decrease address by 3.

## Playback Preset

This menu allows one of the six internal presets to be selected for playback. To choose a preset, change the number in the display with the 'R' button and then exit the menu by pressing the 'L' button. A preset selected in this manner will automatically come on any time the dimmer system is powered. To disable preset playback, press the 'R' button until the display shows a dash '-' and then exit the menu as above.



**P L A** = Menu indicator.

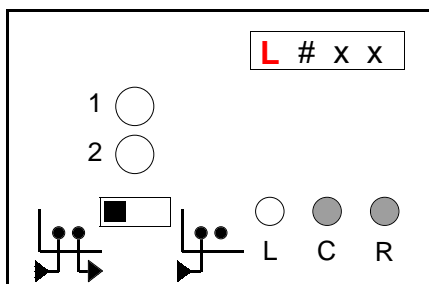
x = Preset number. (1-7 or "-")

### Operation:

- L** Button: Change to "Local Dimmer Control" menu.
- C** Button: No action.
- R** Button: Select next preset.

## Local Dimmer Control

This menu allows individual dimmer levels to be set from the Head-End. Select the dimmer with the 'C' button. Set the dimmer's level with the 'R' button. Exit the menu with the 'L' button. These locally set levels will remain on, indefinitely, if there are no control signals present. If signals are present, the levels set will be terminated when the menu is exited.



**L** = Menu indicator.

# = Dimmer number. (1-6)

x x = Locally set level in Decimal (00-99, FL)

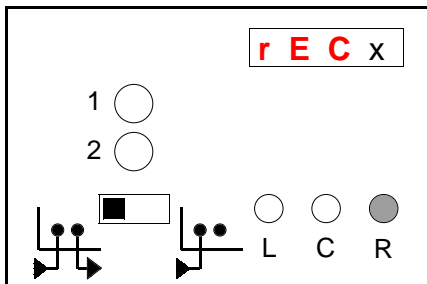
### Operation:

- L** Button: Change to "Record Preset" menu.
- C** Button: Select next dimmer.
- R** Button: Increase level of selected dimmer.

# Head-End Processor Menus

## Record Preset

This menu allows levels which have been set from the console, by the "Local Dimmer Control" menu or by the individual dimmer Focus Buttons to be saved into internal presets for later playback. To record a preset, first set the desired levels, then enter this menu. Select the preset number to record with the 'R' button and then exit the menu with the 'L' button. If the dash "-" is displayed when the menu is exited, no preset record will take place.



**r E C** = Menu indicator.

**x** = Preset number. (1-7 or "-")

### Operation:

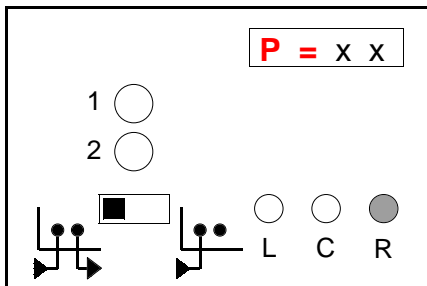
**L** Button: Change to "Display/Set Preheat" menu.

**C** Button: No action.

**R** Button: Next Preset.

## Display/Set Preheat

This menu allows dimmer preheat operation to be enabled or disabled for all dimmers in the unit. Change the setting with the 'R' button, then exit the menu with the 'L' button. When preheat is set to "On", the dimmers will automatically apply a small amount of voltage to lamps which are off to keep them from getting "cold." This is useful when it is necessary to get large wattage lamps to come on as quickly as possible. It is not a good idea to enable preheat in all of the dimmers in a venue as this will cause tremendous amounts of current to be drawn from the power service even though no lights are on. Use the preheat function judiciously on the lamps which really need it, otherwise leave it off.



**P =** = Menu indicator.

**x x** = Preheat mode. ("- " or "On")

### Operation:

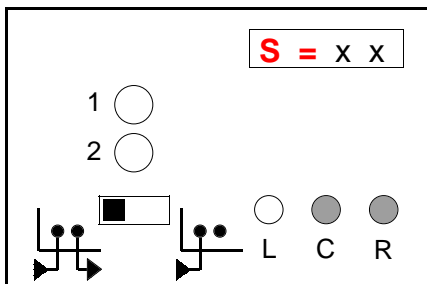
**L** Button: Change to "Display/Set Dimmer Response Speed" menu.

**C** Button: No action.

**R** Button: Toggle preheat setting.

## Display/Set Dimmer Response Speed

This menu allows the dimmer response time for all dimmers in the package to be set to one of 9 values. Enable controlled response with the 'R' button. Select the response time with the 'C' button, then exit the menu with the 'L' button. Controlled response time is used to normalize the amount of time different sized lamps take to come on. The factory default setting is 350mS. When set to "FA", low wattage lamps will come on noticeably faster than high wattage lamps. Dimmers used in marquee "chase" effects should be set to "FA".



**S =** = Menu indicator.

**x x** = Speed indicator. (20-55 or "FA")

### Operation:

**L** Button: Change to "Display/Set Fan Mode" or "Display Console Data" menu.

**C** Button: Next response selection.

**R** Button: Enable/disable "FA".

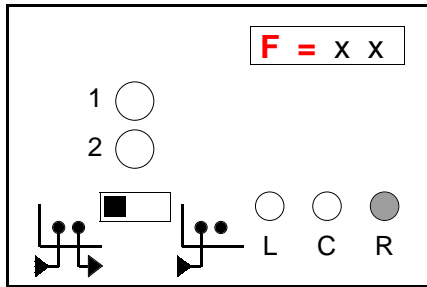
The Speed Indicator is decoded as follows:

FA = As fast as possible	20 = 200mS	25 = 250mS	30 = 300mS,
35 = 350mS	40 = 400mS	45 = 450mS	50 = 500mS
		55 = 550mS.	

# Head-End Processor Menus

## Display/Set Fan Mode

This menu only appears on IPS-DB series dimmer systems. It allows the fan operation mode in these units to be set. Select the mode with the 'R' button, then exit the menu with the 'L' button. When the mode indicator reads "°C" the fan will come on if any dimmer in the box exceeds 45°C and will go off again when all dimmers are below 35°C. When it reads "On", the fan will come on any time a DMX512 or AMX192 signal is present and will go off again when the signal is removed and all dimmers are below 35°C.



**F** = Menu indicator.

x x = Mode indicator. ("°C" or "On")

### Operation:

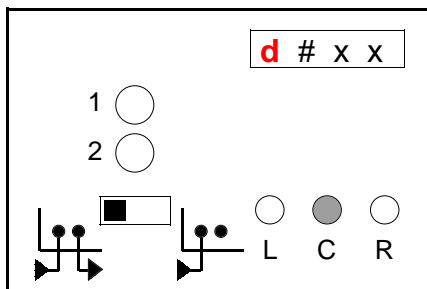
**L** Button: Change to "Display Console Data" menu.

**C** Button: No action.

**R** Button: Toggle fan mode.

## Display Console Data

This menu displays the actual DMX512, AMX192 or Analog level which is being received by the Head-End, then transmitted to each dimmer in the unit. This is a good place to look whenever the dimmers appear to be flickering. If the display shows an unsteady level being received then the dimmers are being 'told' to flicker.



**d** = Menu indicator.

# = Dimmer number. (1-6)

x x = Console level in Hexadecimal. (00-FF)

### Operation:

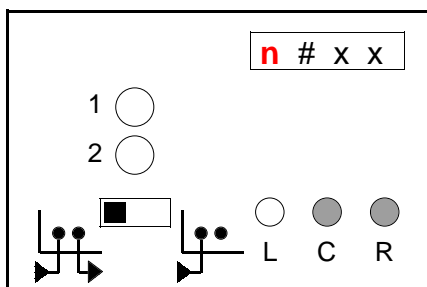
**L** Button: Change to "Display/Set Non-Dims" menu.

**C** Button: Select next dimmer.

**R** Button: No action.

## Display/Set Non-Dims

This menu allows individual dimmers to be configured for "Non-Dim" operation. Select the dimmer to configure with the 'C' button, set the "Non-Dim" threshold level with the 'R' button, then exit the menu with the 'L' button. The "Non-Dim" threshold is the input level at which the dimmer will switch from full off to full on. Select a threshold of "--" to convert a dimmer back to normal operation. When selected as a "Non-Dim", a dimmer will not attempt to regulate its output.



**n** = Menu indicator.

# = Dimmer number. (1-6)

x x = Threshold level in Hexadecimal. (00-FF)

### Operation:

**L** Button: Change to "Analog Input Trim" menu, "Display/Set Demo Unit Input Mode" menu, or "Display/Set Address" menu.

**C** Button: Select next dimmer.

**R** Button: Increase threshold level.

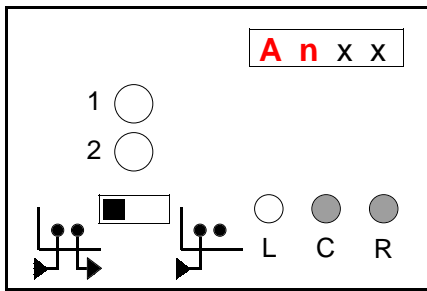


# Head-End Processor Menus

## Analog Input Trim

This menu only appears on IPS dimmer systems which have an AMX192 or Analog input option installed. It allows the analog input section to be calibrated to the actual control voltage used by the control console.

For AMX, set the first dimmer on the data link to FULL. For Discrete Analog set all control inputs to FULL. Select the "FL" trim function with the 'C' button, then execute the function with the 'R' button. Return all control levels to Zero. Select the "00" trim function with the 'C' button, then execute the function with the 'R' button. Exit the menu with the 'L' button.



L

**A n** = Menu indicator.

x x = Trim operation to perform. ("- ", "FL", "00")

### Operation:

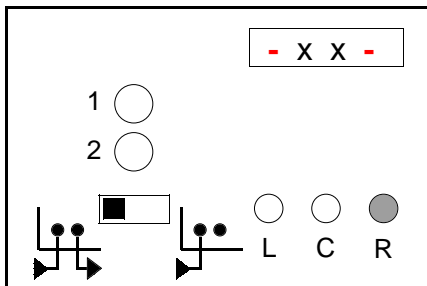
**L** Button: Change to "Display/Set Demo Unit Input Mode" menu, or "Display/Set Address" menu.

**C** Button: Select trim operation.

**R** Button: Execute trim operation.

## Display/Set Demo Unit Input Mode

This menu only appears on IPS demonstrator units. It allows the DMX512 input to be configured for either normal console operation "-CO-", or for connection to the IPS demonstration program running on a personal computer "-PC-". Press the 'R' button to toggle the mode selection, then press the 'L' button to exit the menu.



- - = Menu indicator.

x x = Input mode indicator. ("CO" or "PC")

### Operation:

**L** Button: Change to "Display/Set Address" menu.

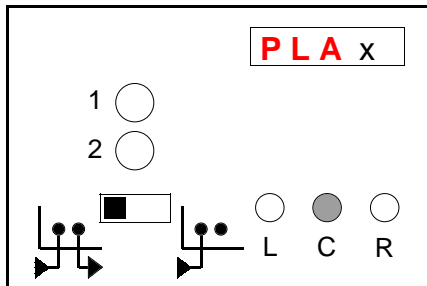
**C** Button: No action.

**R** Button: Toggle input mode.

# Head-End Processor Hidden Menus

## Factory Maintenance Commands

The following commands are accessed from the "Playback Preset" menu by holding down the 'C' button until the "Head-End Data Display" appears.



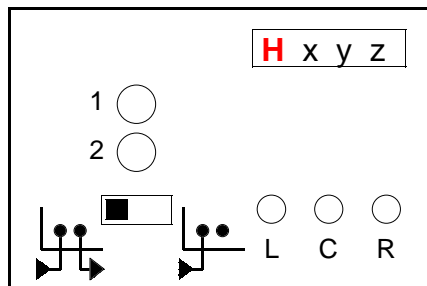
**P L A** = Menu indicator.  
**x** = Preset number. (1-6 or "-")

### Operation for hidden menus:

**C** Button: Press and hold down until the "Head-End Data Display" appears.

## Head-End Data Display

This menu displays configuration data specific to the Head-End processor.



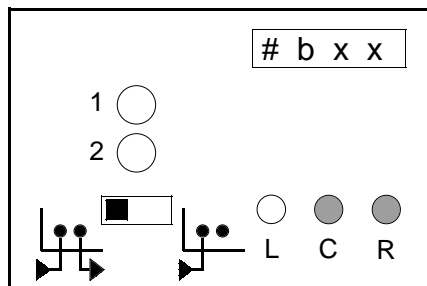
**H** = Menu indicator.  
**x** = Hardware configuration summary:  
8 = Error detected at power-up if set.  
4 = Analog option not installed.  
2 = 6-dimmer unit if set; 3-dimmer unit if reset.  
1 = 120V unit if set; 240V unit if reset.  
**y** = Head-End firmware major revision level.  
**z** = Head-End firmware minor revision level.

### Operation:

**L** Button: Change to "Dimmer Data Display".  
**C** and **R**: (ignored)

## Dimmer Data Display

This menu displays the nine bytes of talkback data available from each dimmer.



**#** = Dimmer number. (1-6)  
**b** = Data byte number. (0-8)  
**x x** = Talkback code in hexadecimal.

### Operation:

**L** Button: Change to "Error History Display".  
**C** Button: Next dimmer.  
**R** Button: Next data byte.

#### Byte 0 Status

80H= Dimmer absent/not responding.  
40H= Unit is operating as a non-dim.  
20H= Line frequency is out of spec.  
10H= "FOCUS" mode.  
08H= No load present.  
04H= Inductive load detected.  
02H= Temperature setback.  
01H= Error present (in byte 1.)

#### Byte 1 Error summary

80H= Miswire-line voltage > 180V at 120V  
or > 360V at 240V.  
40H= Watchdog reset occurred.  
20H= +18V supply undervoltage  
10H= Temperature shutdown.  
08H= Overload shutdown.  
04H= Negative switch shorted.  
02H= ROM checksum error.  
01H= Analog section failure.

#### Byte 2 Configuration summary

80H= Non-dim operation selected.  
40H= Linear voltage curve vs square law curve.  
20H= Force conventional phase control mode.  
10H= Force short fall/rise time operation.  
08H= Set if 240V unit; reset if 120V.  
07H= Three-bit unit capacity field:  
000=1.2kW, 001=2.4kW, 010=3.6kW,  
011=4.8kW, 100=6.0kW, 101=7.2kW,  
110=1.2kW+, 111=12.0kW.

# Head-End Processor Hidden Menus

## Dimmer Data Display (continued)

### Byte 3 Detail summary

80H= (Unassigned.)

40H= Set if preheat enabled for this dimmer.

20H= Set if load determined to be inductive based on long term behavior, not initial reaction.

10H= Line voltage > 140V.

08H= Dimmer not yet configured by Head-End.

04H= Set if dimmer supports 800uS fall time and temperatures allow it to be used now.

03H= Two-bit overload cause field:

00=hardware-detected overload,

01=over rated load,

10=inductive overload on non-dim,

11=load will not "warm up" (valid only if BYTE 1, bit 3 is set.)

**Byte 4** Power device temperature, °C.

**Byte 5** Load size in 100s of watts.

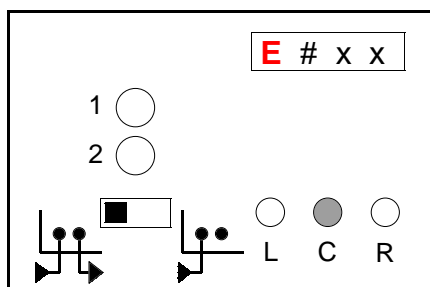
**Byte 6** Present operating level.

**Byte 7** Line voltage in 120V units; line voltage/2 in 240V units.

**Byte 8** Dimmer firmware revision.

## Error History Display

This menu displays the log of all errors that have been reported since the last power-up. This information is in the format of BYTE 1 of the dimmer data described earlier, but differs from that shown by "Dimmer Data Display" because the latter always shows the current dimmer status and the dimmers attempt to clear error conditions by retrying. "Error History" should be used to see if a unit, which appears now to be functioning normally, has a history of any transient errors.



**E** = Menu indicator.

**#** = Dimmer number. (1-6)

**x x** = Error history code in hexadecimal.

### Operation:

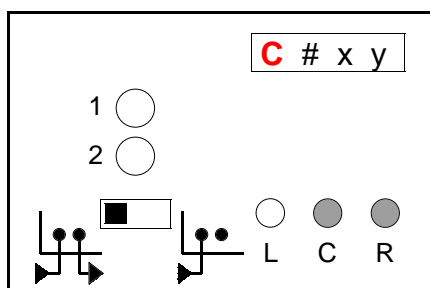
**L** Button: Change to "Configure Dimmer" menu.

**C** Button: Next dimmer.

**R** Button: (ignored)

## Configure Dimmer

This menu allows individual dimmers to be configured for certain modes of operation previously restricted for use in debugging or testing of the IPS.



**C** = Menu indicator.

**#** = Dimmer number. (1-6)

**x** = Changeable configuration bit.

**y** = Unchangeable bit.

### Operation:

**L** Button: Change to "Full Output".

**C** Button: Next dimmer.

**R** Button: Change bits.

Although the full dimmer configuration byte ("Byte 2" earlier) is displayed, the only bits that can be modified using this command are:

40H = Linear voltage curve (versus square law curve.)

30H = Force FPC and short fall/rise time.

20H = Force conventional phase control mode.

10H = Force short fall/rise time operation.

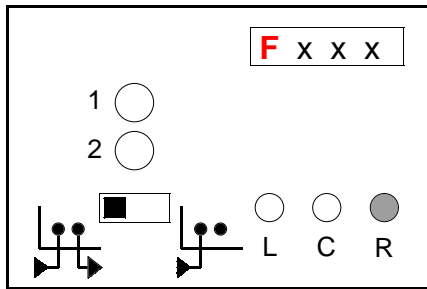
Although pressing the 'R' button causes these bits to change in the third digit of the display, the modification does not take effect (and is not recorded in the EEPROM data base) until another command is selected by pressing the 'L' button, or by a timeout.

# Head-End Processor Hidden Menus

## Full Output Selection

This menu allows for setting the maximum output voltage for all dimmers in an IPS unit. This setting defines the desired output voltage for a control level of 100% (and proportionately for all other levels.) The choices vary with the unit's line voltage. For 120V units, the default is 120V; only "RDS" units have the additional option of 100V. For 240V units, the default is 240V, but 220V and 230V are also available.

The display shows the currently selected maximum voltage. To modify it, press the 'R' button until the desired entry appears, then exit by pressing the 'L' button, or allow the display to timeout.



**F** = Menu indicator.

x x x = Maximum output voltage.

("F120" or "F115" for U.S. 120V units)

("F120", "F115" or "F100" for "RDS" units exclusively.)

("F240", "F230" or "F220" for 240V units)

### Operation:

**L** Button: Change to "Erase EEPROM" menu.

**C** Button: (ignored)

**R** Button: Next maximum voltage.

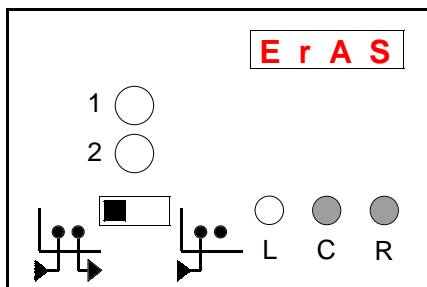
## Important

IPS Dimmers, when set for the "F120" curve will produce 120 VAC at the lamp. Many other dimmers will not, due to losses across the choke and load wiring. **If using 115V lamps be sure to set the dimmers to "F115" or lamp life will be substantially reduced!**

## Erase EEPROM

This menu allows for returning the EEPROM to its initial default configuration. If the 'C' button, or the 'R' button is pressed while in this command:

- The start address is reset to 001.
- All non-dims are removed.
- All presets are erased.
- Preheat is cancelled.
- Response speed is set to 350mS.
- Non-standard dimmer configurations are discarded.
- Maximum output voltage is set to 120V (240V for 240V units.)



**E r A S** = Menu indicator.

### Operation:

**L** Button: Change to "Display/Set Address" menu.

**C** Button: Erase EEPROM.

**R** Button: Erase EEPROM.

# Head-End Software (Old and New)

With regard to older product still in the field...

## IPS Software Compatibility

Rosco/Entertainment Technology is always improving the performance and features of the IPS dimming line. This usually takes the form of new software for the dimmers and/or the Head-End Processor. Sometimes both the Head-End and the dimmer software must be upgraded at the same time within a bar or box to operate properly.

At the end of 1993, ETI upgraded both the dimmer and Head-End software (H2.8/D4.8) to improve the dimmer response speed in lamp chases. Dimmer and Head-End software may be mixed within a bar or box only according to the chart below. There are no restrictions about mixing bars and boxes with different software levels in a system.

Head-End Version	Dimmer Version	Comment
H2.7 and below	All versions to date	D4.7 and above will work, but response is not enhanced.
H2.8 and above	D4.7 and above	Enhanced response, correct talkback.
H2.8 and above	D4.6 and below	Dimmer will respond to levels, but will not produce correct talkback data. Do not use!

## IRCP Commands

IPS dimmers can be remotely configured using IRCP commands transmitted over the DMX512 data link. Historically there have been two different versions of these commands. Head-Ends prior to H3.2d implemented the version known as "Old Style". Head-Ends starting with H3.2d implement "New Style" IRCP commands. The two styles are not compatible with each other. Older Rosco ET consoles such as Access and Eclipse transmitted commands in both styles so that both old and new IPS equipment would respond. Starting with Horizon, RET no longer supports the "Old Style" IRCP commands.

Head-Ends starting with H3.4b implement two new IRCP commands to manage Low Harm™ operation of IPS dimmers..

## Current Head-End Software Releases (09 / 2000)

Version	Comment
H3.4b	Used in bars or boxes containing 6 dimmers.
H3.4b 3-bar	Used in bars or boxes containing only 3 dimmers.
H3.4b RDS	Exclusively for "RDS" bars or boxes containing 6 dimmers.
H3.4b RDS 3-bar	Exclusively for "RDS" bars or boxes containing only 3 dimmers.
H3.4b Demo	Software used in IPS Demo Bars only.
H3.2e SSR	Used only with a <i>specially customized</i> Head-End Processor for Relay Switching Strips and Boxes.

## Head-End Processor (notes)

## Head-End Processor (notes)