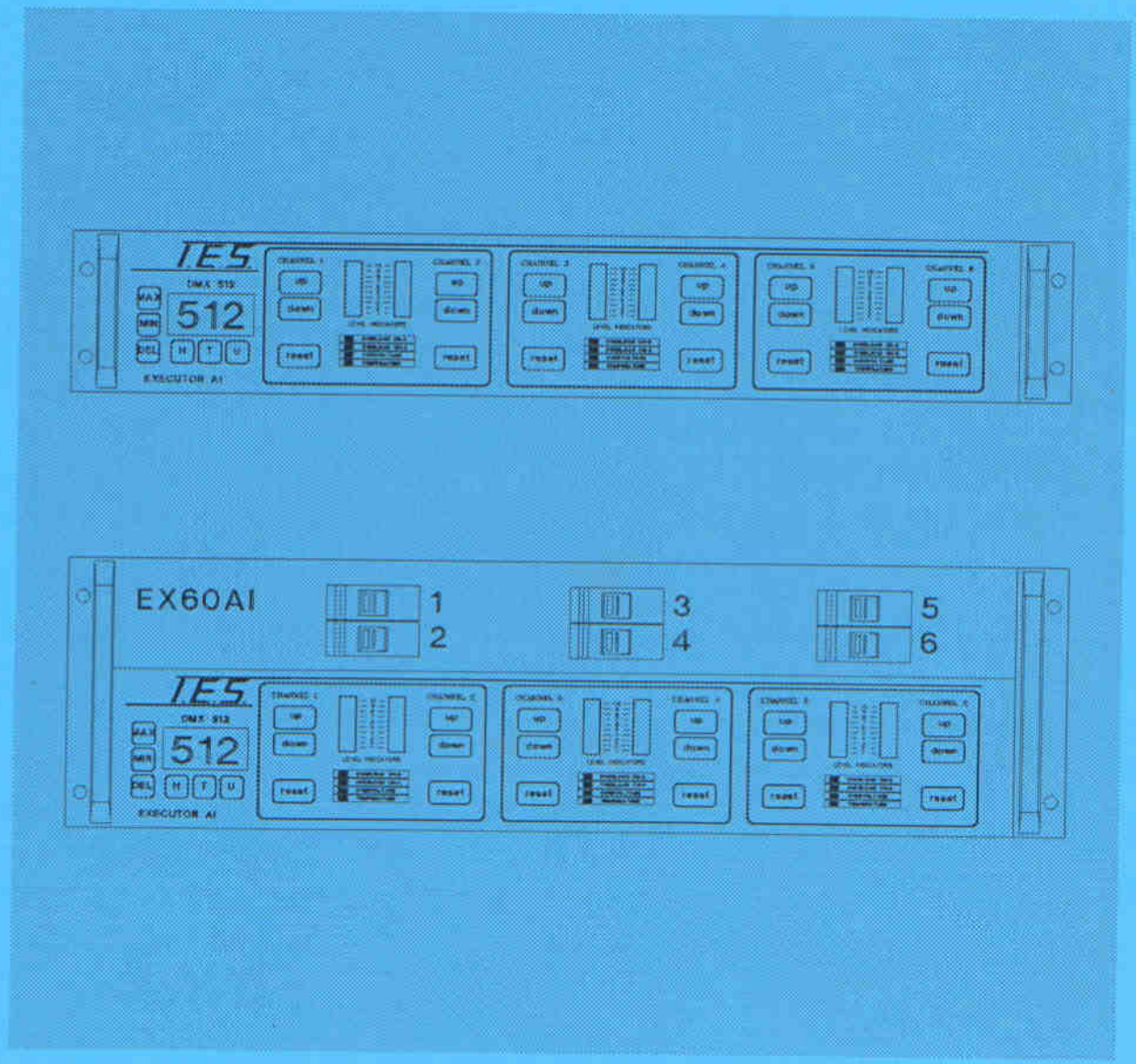
User manual

EXECUTOR 15/30/44/60AI



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• INTRODUCTION:

Congratulations with the purchase of the excecutor 15 AI 6 x 2.5 KW dimmer unit. This dimmer unit is provided with state of the art components. This will not only guarantee a high quality standard but will also offer a flexible and user friendly control of several dimmer parameters. The unit is microprocessor controlled and in using this new technique gave the dimmer unique new features. The dimmer is short-circuit protected not using fuses but an internal current monitoring and protection system. The same protection system checks the internal temperature and supply voltage and will in case of an alarm condition switch off the involved output. A dimmer channel can be controlled manually, via standard 0 - 10V or via dmx 512 both optical isolated. It is also possible to monitor all parameters and control dimmer output individually on a pc with a standard serial communication package. (not IES supply) or the EXECUTOR overhead programm. The excecutor is designed together with experienced theater and rental users. Each part contributed with their own specific problems and experience to the present functions. Changes to the functionality will be easily upgraded by inserting different eproms containing the new software. This flexibility will ensure long term use of the excecutor 15 AI dimmer unit.

This manual will guide you through all functions step by step.

ALARMING:

Internally the dimmer has four electronic circuit boards. One of these boards carries the microprocessor and communication logic for DMX512 and RS232. The other three boards are the actual powerstages. A dimmer circuit board carries two dimmer channels. Each phase of the main supply will be connected to one dimmer board. The internal setup is easily seen looking at the front panel. Dimmer channels one and two, three and four, five and six represent the layout of the internal dimmer circuits. For alarming the internal board configuration plays an important role. Some alarms are specific for each dimmer channel, other alarms are related to one dimmer circuit board.

Alarm conditions:

Indication of alarms are the leds and messages below the output indicators for each dimmer pair. Alarm messages are also reported to the display. If more alarms occur at the same time the alarm last detected will be shown on the display. Alarm messages can also be monitored using the serial communication to the dimmer. (see chapter serial communication) The dimmer outputs are shortcircuit protected. If an shortcirtuit should occur between two independent phase of the main supply the dimmer alarm circuit will **NOT** respond. The internal fuse will protect the dimmer against component failure. The electronic circuitry of each dimmer board is provided with a transformer that can handle voltage inputs up to 450VAC. This will prevent component failure incase of a corrupt mains supply. This

• OVERLOAD INDICATION:

Each dimmer is provided with an overload detection. Overload indication will indicate two overload states.

-If the load exceeds 13.5A for more than 2 seconds, The over- load guard is activated and will turn off the output. The matching alarm led is on continuously. The display will have the message E-(x). X will be the channel that is in the over- load condition. ex E-1, channel one is in overload. The dimmer will test the overload condition 3 times within the next minute. If the overload condition disappears within this period, the channel will softstart and automatically continue normal operation. If the overload condition remains present after this period, the channel is switched off permanently and can only return to normal operation after the appropriate reset button is pressed.

-If the load exceeds 25A the channel is switched off within 2mS. The matching overload led will be flashing. The display will have the message E-(x). X will be the channel that is in the overload condition. ex E-1, channel one is in overload. The dimmer will test the overload condition 3 times within the next minute. If the overload condition disappears within this period, the channel will softstart and automatically continue normal operation. If the overload condition remains present after this period, the channel is switched off permanently and can only return to normal operation after the appropriate reset button is pressed.

• OVERVOLTAGE ALARM:

Overvoltage is detected if the supply voltage is above 260 VAC. The overvoltage led for the dimmer pair involved will be on. It will shutdown the outputs of the involved dimmer pair. This will protect dimmer failure in case off faulty connection of neutral and phase. The display will have the message A- (xx). XX will be the dimmer pair that has the overvoltage condition. ex A-12, the first dimmer circuit is in overload. The dimmer will continuously test the overvoltage condition. If the overvoltage condition disappears, the channel will softstart and automatically continue normal operation.

• TEMPERATURE ALARM:

If the temperature reaches 85C overtemperature is detected. It will shutdown the outputs of the involved dimmer pair. The led temperature will be on. The display will have the message A- (xx). XX will be the dimmer pair that has the overvoltage condition. ex A-12, the first dimmer circuit is in overload. The dimmer will continuously test the overvoltage condition. If the overvoltage condition disappears, the channel will softstart and automatically continue normal operation.

DEL- T menu settings

The del T menu offers the following functions:selection of dimming curve and activation of analog input calibration menu. To enter the del T menu del and T must be pressed longer than 5 seconds continuously.

- **Selection of dimming curve:**

After activation of the del T menu the display will show C- (x). X will show the active curve. The dimmer recognizes 7 curves. The curve selection is a global setting and cannot be set for each channel individually. Via the U key the number after the C can be incremented to the value, dimming curve needed. Dimmer curves available are:0 =S-law curve, 1 = lin, 2 = squarre, 3 = fluorecent, 4 = tv light, 5 = future use, 6 = future use, 7 = future use. Factory default curve is the S-law curve.

Del U menu:

The del U menu controls parameters for serial communication. This menu is a dipswitch menu. The enter the del U menu the del and U key must be pressed for 5 second simultaneously. Each channel represents a dipswitch. If the lower half of the display is on this represents an off and if the upper half is this represents an on state. The following functions, parameters can be altered. dipswitch one : enable (on), disable (off) communication. Dipswitch two : enable (on), disable (off) monitor data transfer. Dipswitch three enable (on), disable (off) bidirectional serial control. Dipswitch four enable (on), disable (off) error monitoring. Dipswitch 5 and 6 are currently not used. When the del U menu is activated and the serial communication is enabled the display will show valid information about the pc-communication address. Default value for the pc address is 00. This address must be an unique number and is not related to a dmx address. To set the pc address use the H,T,U key's.

normal operation mode:

After mains power connected to the dimmer, the dimmer will perform a selftest. During the selftest all indicators in switches, alarm indicators and the output indicator will be activated. Use this feature as a test to see if all indicators work.

The dimmer will adjust settings of dimmer parameters to values last stored. If no dmx or analog signal is set to the dimmer the output indicators will be off and the display will show either the dmx channel selected or the ANA message. ANA will indicate analog control. The dimmer is now ready for use. This state will now be referred too as the normal operation mode.

In normal operational mode the user can perform the following operations:

Visual control over channel output via level indicators Selection of dmx channel Selection of analog operation Monitoring of dimmer settings Manual control of dimmer output reset of dimmer channel Selecting 50/60Hz operation

• Manual control:

Each dimmer channel is provided with an up,down and reset key. Manual control of the output of each channel is done using the up, down key. Up will force the output of the channel to gradually provide 100% output. Down will force the output of the channel gradually 0% output. During manual control a highest selection of the input and the value set via the up or down key is set to the dimmer. This means that if via the analogue or dmx input the channel is set to 100% the down key will have no effect on the dimmer output.

• Reset key:

The reset will perform a reset for the specific channel. The output of a channel will be forced to 0% output. In certain alarm conditions the reset will reset the alarm message. Reset is also used to return to normal operation in parameters setting menu's. If parameter settings are check the reset key will select the channel to be monitored.

• Selection of dmx channel:

The dimmer will use a consecutive number of 6 dmx channels. When selecting the so called base address, this is the dmx channel number for dimmer one, automatically 6 consecutive dmx channels will be occupied by this dimmer. This implies that in a system involving multiple dimmers unit, each dmx base address of each dimmer unit should be set to multiples of 6 to keep each dimmer channel unique within the dmx chain. The H,T,U key select the dmx channel. The H key will increment the 100 denominator. The T key will increment the 10 denominator. The U key will increment the 1 denominator. Each key press will increment the denominator by one. If pressed long enough the value will wrap around to the lowest value for the denominator selected. In the dmx protocol it is possible to select an address from 1 to 512. Selection of address 0 and an address above 512 is not possible. When using the H key to increment the 100 denominator in the display, it will increment the dmx channel base number. If pressed long enough the number in the display will return to 100 and not to 000. To return to a dmx channel setting lower than 100, select dmx channel number 512 using the h t u key's. Now use the U key to set the dimmer to channel 001. The same is true for the 10 denominator. The display will never show 000, since this is not allowed in the dmx protocol. Automatically the dimmer stores the selected dmx channel.

• Selection of analogue control:

Control of the dimmer via the analog input is done by selecting a dmx address above 512. This is done using the H,T,U key in the normal operation mode. The dimmer will automatically switch to analog control. The display will now show ANA. After selection of ANA the dimmer will store this setting.

DEL-H menu settings

• Adjusting minimum output (preheat)

By default the adjustment of the minimum (preheat) is selected after activation of the del H menu. Each output indicator will have the lowest led flashing, the display will flash and the led in the min key will be on. Before altering the minimum output for the dimmer channels check the selection of channels. Use the down and up key for each channel to make the correct selection. The minimum output can now be set using the H, T and U key's below the display. The minimum output can be set to any value between 0% and 29.9% of the maximum output. Information thus set is immediately stored in the dimmer. To leave this menu a reset button must be pressed. To make other alterations within the functions available in the del H menu, select function using del, min or max key. If different min values are to be stored. Select min again after selecting a different parameter or readjust the channel selection using the up and down key's.

• Adjusting maximum output

After activation of the del H menu, selection of maximum output is done by pressing the max key. Each output indicator will have the highest led flashing, the display will flash and the led in the max key will be on. Before altering the maximum output for the dimmer channels check the selection of channels. Use the down and up key for each channel to make the correct selection. The maximum output can now be set using the H, T and U key's below the display. The maximum output can be set to any value between 30% and 99,9% (99,9% is 100%) of the maximum output. Information thus set is immediately stored in the dimmer. To leave this menu a reset button must be pressed. To make other alterations within the functions available in the del H menu, select function using del, min or max key. If different max values are to be stored. Select max again after selecting a different parameter or re adjust the channel selection using the up and down key's.

• Selecting solidstate function:

Each dimmer channel can function as a dimmer or as a switch, solid state channel (zero crossing). To select the switch function enter the maximum channel output adjustment using the key sequence del H and max. Make the appropriate channel selection using the up and down key's. The switch function is active if the maximum output is set 100%. Adjust the display until it indicates 99,9. Now press the U key. The display will show 1-0 indicating that the switch function is active. To deselect the switch function simply set the maximum output level to a value between 30% and 99,9%.

• Adjusting delay times

The delay time for each dimmer channels is the time it takes for a dimmer channel to travel from 0% to 100%. The time value influences dimming delay up and down with the same setting. After activation of the del H menu, adjusting of delay times is done by pressing the del key. Each output indicator will have the highest and lowest led flashing, the display will flash and the led in the max key will be on. Before altering the delay time for the dimmer channels check the selection of channels. Use the down and up key for each channel to make the correct selection. The delay time output can now be set using the T and U key's below the display. The delay time set is shown in seconds. The minimum delay time is 0 seconds. The maximum delay time is 9,9 seconds. To leave this menu a reset button must be pressed. To make other alterations within the functions available in the del H menu, select function using del, min or max key. If different del values are to be stored. Select del again after selecting a different parameter or re adjust the channel selection using the up and down key's.

• ANALOG CALIBRATION MENU:

After selection of the del T menu the output indicators will have their upper half or their lower half of the display on. This so called dipswitch represent on off states for functions within the dimmer. Currently only dip-switch 4 in the del T menu is used. By using the up down key's alongside the desired output, dip-switch, the switch can be set to 0 off state, lower half of display on, or to 1 on state, upper half of display on, using the up key. Analog calibration can only be activated if the del T menu was activated and the dimmer was set to ANA. Ana is activated setting the dimmer to an dmx address higher than 512 in the normal operational mode.

* Calibration of analog input:

Select analog control and activate del T menu. In the del T menu activate dip-switch 4 via the up key. By leaving the del T menu analog calibration is activated, use a channel reset key. The dimmer will default in the zero, minimum output level calibration for channel 1. The display will now show 1.xx. The first number indicates that analog input calibration is activated for channel 1. By using the H key the selected dimmer channel can be selected, 1 to 6. The xx number is the actual input value. Via the min key the minimum output level can be adjusted, via the max key the maximum output level can be calibrated using the up down key for the selected channel. Selection of each channel and calibration level, min or max is free at choice during the analog calibration process. To return to the normal operation mode press a reset key.

Before calibration can start the internal conversion of the analog control signal must be explained. The 15AI dimmer converts the analog control signal for each input using a 12 bit analog to digital conversion. This will result in 4096 dimming steps within the control voltage range of 0 to 10 volts. In analog calibration mode the last two digits represent the input voltage applied in the adjusted input channel. Since the display is not equipped with enough digits to show the full and actual internal representation of the digitized input voltage, the display will show a range of 99 digits of the internal control signal. If adjusted the display will if incremented and wrap around to the next 99 steps of the internal signal value. Not all key presses will result in a display change. It is therefore inevitable to connect an actual load to the channel to be adjusted to have visual control of the calibration process.

If all channels should carry the same adjusting settings press the del key during calibration. Only one channel needs to be calibrated. The settings for this channel will be stored for all channels.

* advised calibration method.

1) connect load to channel to be calibrated 2) connect adjustable control voltage to channel to be calibrated. 3) Select analog control 4) Enter del T menu and activate switch 4 5) Press a reset key to start analog calibration 6) Dimmer will default in min calibration for channel 1 7) Select using the H key the channel to be calibrated 8) Set analog control voltage to 0V on the selected channel 9) The two left digits should read 00. If not correct this by using the up down key of the channel that is calibrated. First press up twice, then use the down key to set the display to read 00. 10) To adjust max level press max key. In calibrating the max level it is imported to follow the following adjusting procedure. 11) Set input control signal to 10V on the channel that is calibrated. 12) First us down key to step some digits down. Now use up key until the display shows 99. Press up key until the load on the output of the channel is out. This means that a wrap around has occurred from max to min level. PRESS DOWN KEY TWICE. The lamp must now be on full. If up is pressed too much the display will show 1.E, use down key to restore. 13) calibration of other channels can now be done selecting a new channel number using the h key. The above mentioned calibration procedure starting at step 7. 14) If all channel that needed to be calibrated are done use reset key to leave the analog calibration menu.

• MONITORING OF DIMMER SETTING:

When the dimmer is in the normal operational mode several dimmer setting can be monitored. Some settings are specific for each dimmer channel, others involve general dimmer parameters. As an default parameter the display will show the selected control mode, either ANA or the dmx channel.

General dimmer settings:

For monitoring the mentioned key's or key combinations must be pressed longer than 1 second.

By pressing the min button the display will show the line frequency currently set to the dimmer. The value in the display will be 50H or 60H, being 50 hz and 60 hz. The display will only show this parameter during one second.

By pressing the max key the display will show the current software revision. This revision number is of great importance when reporting problems with the dimmer unit to IES.

By pressing the del key the display will show the pc-address only if serial communication was enabled. Otherwise the del will not give any information.

By pressing the del and a channel reset button the display will show the delay time set for this channel. Delay time is shown in 0.0 to 9.9 seconds.

By pressing the min and a channel reset button the display will show the minimum or preheat set for this channel. This value is a percentage of 100% output. This value should be between 1% and 29.9%.

By pressing the max and a channel reset button the display will show the maximum available output set for this channel. This value is a percentage of 100% output. This value should be between 29.9% and 100%. If a channel was in the solidstate mode the display will indicate E-0. protected menu functions:

The menu function are protected against accidental alteration by special key sequence. By pressing del and the H or T or U key's simultaneously for 5 sec the protected menu functions are available. The dimmer unit is provided with three protected menu's: The del H menu offers to set the delay time, minimum (preheat) and maximum output for each channel. The del T menu used for analog input calibration. The del U menu used to adjust and enable parameters for serial communication. If the del T menu is activated, submenu's (min, max and delay) can be selected pressing the appropriate key. Since the del T menu offers adjustments specific to each channel, a selection must be made before altering the selected parameter. At default all channels are selected. A selected channel is indicated by a flashing led(s) in the output indicator. To de- select a channel from being altered, the down key for this channel must be pressed. This will stop the flashing of the output indicator. To reselect this channel the up key must be pressed. The channel output indicator will have a flashing output indicator again. To leave a menu a reset key must be pressed. The dimmer unit will return to the normal operational mode. To check settings done to the min. max and del value the monitoring function in normal operational mode can be used. Each time a value is altered using the display and del H,T,U key's this value is set to the selected channel. It is to be advised to use the H,T,U key's only if an alteration needs to be done.

• INTERNAL DIPSWITCH:

Internally the dimmer is provided with a hardware dipswitch. After the top cover of the dimmer is removed the dipswitch can be found on the printed circuitboard that is placed on the front panel. The dipswitch is located just behind the channel 6 text on the front panel layout. Some of these switches will override software settings.

-Dipswitch 1-4 Enables the calibration mode for the analogue input. For calibration techniques see according chapter in manual. -Dipswitch 1-3 enables the diagnostic data output (9600 bd) -Dipswitch 1-2 enables the self-test mode -Dipswitch 1-1 returns all settings to default shipment settings. This function is only effective if the dipswitch is put into the on position and power is switched off and on. After the default values are loaded return switch to off position.