LEPRECON®

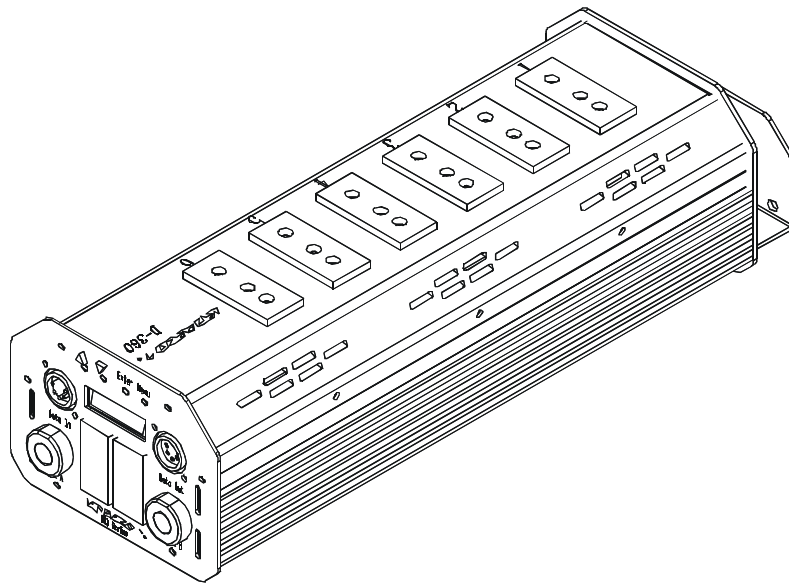## ULD-360DMX and ULD-360DMX-HP
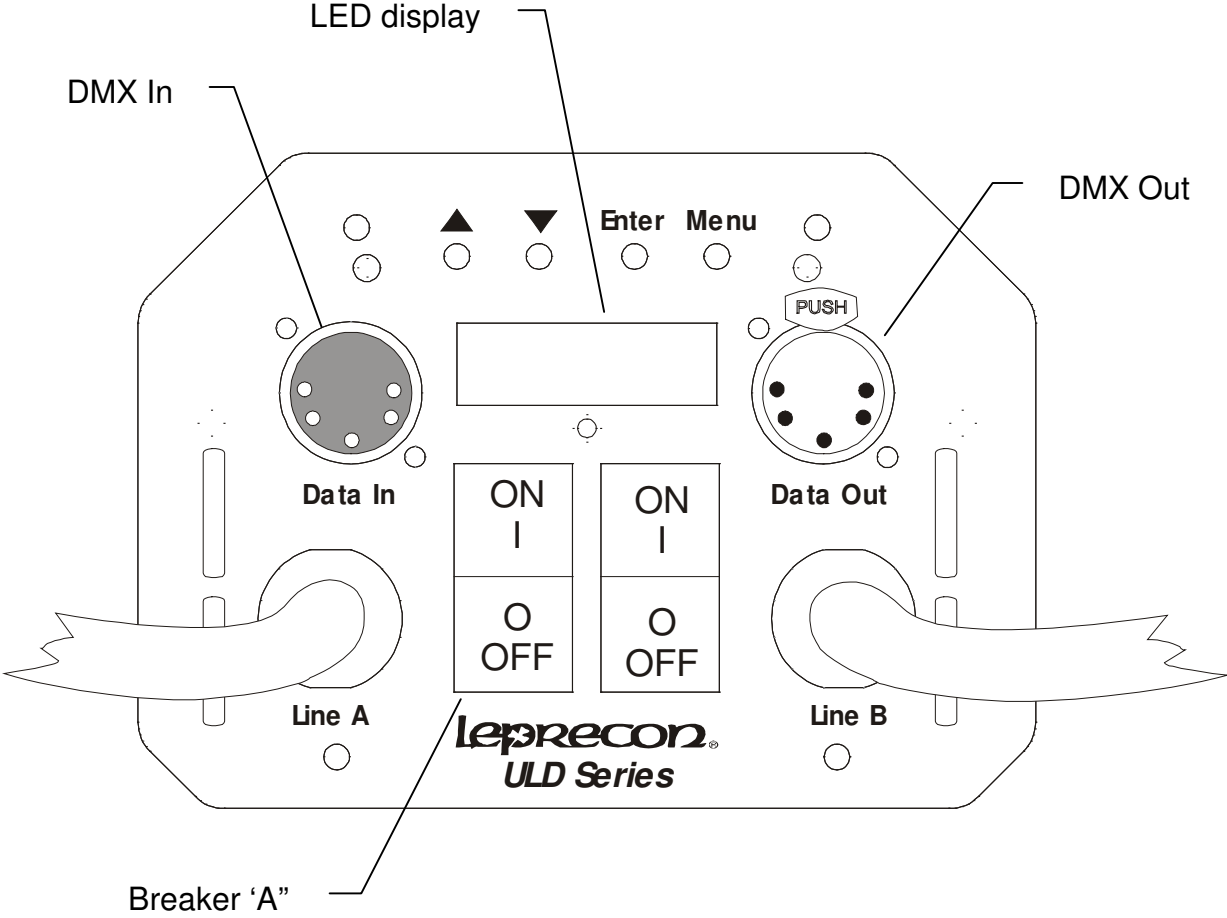## USER'S MANUAL

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Publication 21-1046 Rev B

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Leprecon
ULD Series

Breaker 'A"

1) Introduction

The new ULD series dimmer is designed to be a capable and reliable solution for temporary and portable dimming requirements. With the menu-based interface, the dimmer can be configured for different applications, including stand-alone use without a controller. Default values can be restored at any time, clearing the internal memory back to the standard values.

Please take a few minutes to review the specifications and operating features of the ULD-360 dimmer.

The ULD-360 dimmer is designed for use with conventional incandescent fixtures. Transformer loads, such as low voltage devices using a step-down transformer, may require an additional load to be connected to the same circuit to operate properly.
For operating florescent fixtures, see the section regarding Front Panel Controls.

2) Specifications

Power Connection

Unless otherwise indicated, your ULD-360 dimmer is designed for connection to standard US power systems, 120 VAC 60 Hz. Lamp connections must be 120 V devices only. Line voltages over 135 VAC will trigger the overvoltage protection circuit and shut off the dimmer pack.

Ambient Temperature

The ULD-360 dimmer is designed for use in a cool, ventilated area. Ambient air temperature must be less than 40 degrees Celsius, or about 104 degrees Fahrenheit.

Power Capacity

The ULD-360 DMX is unique in the market of small portable dimmers. A single breaker is used on the pack instead of individual fuses per each channel. As a result, the limits of the dimmer are *pack* limits, not channel limits. The following guidelines should be followed:

> ULD-360 DMX
> Pack Limit: 15 Amps

> ULD-360 DMX-HP
> Pack Limit: 15 Amps per line cord, or 30 amps total

Control input

The ULD-360 DMX accepts DMX 512 1990 as specified by USITT. Reliable DMX systems require cable rated for data communication at 250K baud; for this reason the use of microphone cable is **NOT** recommended. DMX rated cables are available pre-manufactured from your Leprecon dealer. For more information on the DMX standard and acceptable cable, see the Appendix at the end of this manual.

For convenience, DMX in and out connectors are provided on the ULD-360DMX. This allows easy connection to additional dimmer packs. The DMX standard allows up to 32 dimmers to be connected to a single DMX controller.

For proper operation, it is recommended that the last dimmer in the system have a termination plug placed in the DMX Out connector. Termination plugs can be purchased, or easily built by installing a 120-ohm resistor between pins 2 and 3 of the 5 pin XLR.

3) Optional Wireless DMX

All Leprecon ULD models are available with wireless DMX capability. This system has been developed by Wireless Solutions, and offers increased flexibility and convenience for setting up a DMX system. Leprecon w-DMX dimmers will be compatible with other W-DMX equipment that uses components from Wireless Systems.

When a ULD-360 is used in a wireless system, it converts the wireless signal to a conventional DMX signal. The DMX output of the wireless dimmer can be used to drive other conventional DMX receivers, such as other ULD dimmers that do not have wireless capability.

So, in a wireless system, one dimmer can be used to receive the signal from the transmitter, and connect with DMX cable to up to 32 other standard DMX devices.

W-DMX dimmers are identical to the standard ULD models, with these additions:

- Internal receiver card and power supply
- External antenna
- Switch and LED indicator for setting the communication link.

Background Information

The W-DMX system uses a 2.4 GHz radio signal to transmit DMX data. Spread-spectrum transmission (AFHSS) technology prevents interference with the DMX signal from other radio devices.

Range for the W-DMX is approximately 2300 feet using the standard antenna with a clear line-of-sight. The signal will penetrate walls and other barriers, but the signal level will be reduced. Human bodies will block the signal, so it is best to locate the transmitter and receiver above audience areas.

W-DMX Link

The ULD dimmer is designed to receive data from any of the W-DMX transmitters. A system is complete when the receiver is 'linked' to a specific transmitter. Establishing this 'link' allows many receivers to be controlled by a single transmitter, and also allows multiple transmitters to be used in the same area, each controlling a specific receiver.

The ULD dimmer endplate has two controls for setting up the W-DMX link.

The LED located on the dimmer endplate shows the status of the wireless link.

- OFF – Dimmer is not linked to any transmitter. DMX cable input can be used.
- ON – Dimmer is linked to a transmitter, and receiving DMX data.
- ON, short blink off – Dimmer is linked to a transmitter, but no data is being received.
- On / Off flash – Dimmer was linked, but connection was lost.

The push button switch next to the LED is used to unlink the receiver from the transmitter. To do this, press the switch, and hold it down for four seconds. The LED will turn off, indicating that the link has been broken.

To establish a link to a specific transmitter:

1) Unlink the dimmer by pressing and holding the switch as described above. Verify that the LED is off.

2) Press the function switch on the TRANSMITTER for one second. The dimmer LED should light to indicate that it is now linked to the transmitter.

To unlink ALL dimmers from the transmitter:

1) Press and hold the function switch on the TRANSMITTER for four seconds. The status LED's of all dimmers previously linked to that transmitter will turn off.

More information can be found in the manual for the specific W-DMX transmitter that you have in the system.

3) Installation

Mounting

The ULD-360 is designed for vertical mounting. The top hanging bracket has a pre-punched hole for a standard ½" pipe clamp mounting bolt. Using this mounting point allows the dimmer to be mounted with the power cords, DMX display and DMX control connectors facing downward.

The ULD-360 dimmers are passively cooled, using no internal fans. The heat generated by the dimmer is dissipated by the extruded metal chassis and the airflow through the chassis vents. For this reason, mount the dimmer so that air is free to circulate around the dimmer. The dimmer should be mounted with at least 12 inches of clearance between the dimmer and any ceiling or obstruction above the dimmer that would block air circulation.

Power Connection

Leprecon LD360 series dimmers are supplied with line cords that have standard Edison plugs attached. Each line of the LD360 should be connected to a service capable of supplying 15 amps and protected by a properly sized circuit breaker.

If you have any questions about the suitability of the power circuit that you intend to use with the LD360 dimmer, consult with a qualified electrician.

Load Connection

The LD360 DMX dimmer is offered in several different models. Options include stage pin, Nema 5-15 duplex, and Nema L5-20. Lamp loads are plugged directly into the outlets on the body of the dimmer.

4) Turning on Power

The ULD-360 has one line cord and circuit breaker, and the ULD-360HP has two of each, as illustrated previously. On the HP model, the line cord and breaker to the left on the endplate, labeled 'A', supplies power for channels 1-3, as well as the internal power supply for the control electronics. Line cord and breaker 'B' supplies power to channels 3 through 6.

Power applied to the dimmer is signaled by an internal green indicator in each of the breakers. If the breaker is on, but not lighted, there is no power to the line cord. Turning on breaker 'A' will also light the red LED display.

Note:
The unit can be Reset to original factory settings by depressing and holding the ENTER switch while turning on the first breaker.

5) Front Panel Controls

The ULD-360 dimmer uses a 4-digit display and four entry switches to set pack functions, and display operating status.

Resetting the ULD-360 to default values:

The unit can be Reset to original factory settings by depressing and holding the ENTER switch while turning on the first breaker.
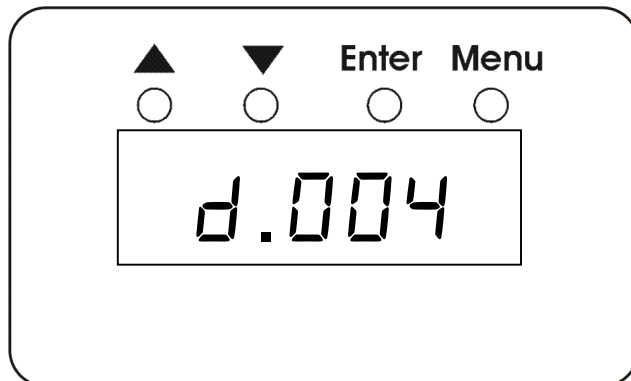
Address Menu

When the dimmer is first turned on, the display shows the starting channel address of the ULD-360. This is the DMX address that will control the first channel of the pack.

When there is no DMX input, the channel number is preceded by the letter A for address:
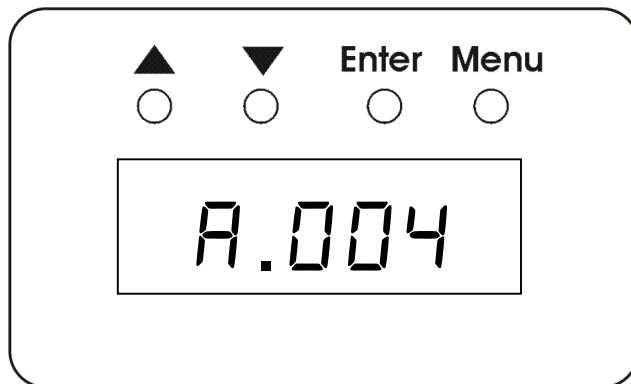
When valid DMX is detected, the letter 'A' is replaced with the letter 'd' for DMX:

The UP/DOWN keys change the value for the start address. The ULD-360 uses the changed value immediately and permanently saves it after 10 seconds or if the Enter or Menu key is pressed.

After power on, the ULD-360 remains in the Address Menu in its simple interface mode. To go to any other menu requires the user to hold the MENU key for about 5 seconds.

Setting Start Address

The default start address for the ULD dimmer is 001. That means the first dimmer circuit will respond to the first DMX channel from the controller. If the controller is set to a 'normal' patch, dimmer circuit1 will respond to control channel 1, dimmer circuit 2 will respond to control channel 2, and so on for all of the circuits in the pack.

If you have multiple ULD dimmers, generally the first dimmer will be set to start address 001. Assuming that each dimmer has six circuits, the start address for the second pack would be 007. This sets up each dimmer with independent control for each dimmer circuit.

Channel Mode Menu

The Channel Mode Menu allows setting the mode of each dimmer channel.
This mode is indicated by the letter 'c' in the display:
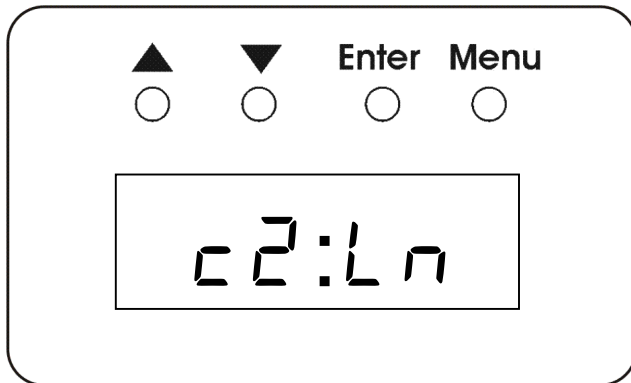
Set the mode for the displayed channel by pressing the UP/DOWN keys. The possible channel modes are:

| Mode	Description
Ln	Linear output. Standard dimmer channel.
Nd	Non- dim. Fader input above 60% turns on channel to 100%. Input below 40% turns off channel.
FL	Florescent output. Dimmer does not begin to turn on until 20%.
00-FF	Fixed output level. Values are 0, 10-99 and FF. FF is 100% output.

After changing the mode the colon will blink to indicate new data has been entered. Press the ENTER key saves the change, and advance to the next channel.

TheULD-360 returns to the Address Menu automatically after 4 seconds if no keys are pressed in the Mode Menu.

Status Menu

When the ULD-360 is in the Channel mode, pressing 'MENU' again will start the Status mode. When Status mode starts, the state of each channel will be shown in sequence, with the display cycling from Channel 1 to Channel 6, then automatically cycle back to channel 1. This automatic cycling is indicated by the flashing colon.

The Status Mode first displays the current input state of the dimmer channels 1-6. If valid DMX is present, the letter 'd' is displayed, followed by the DMX value for the channel:
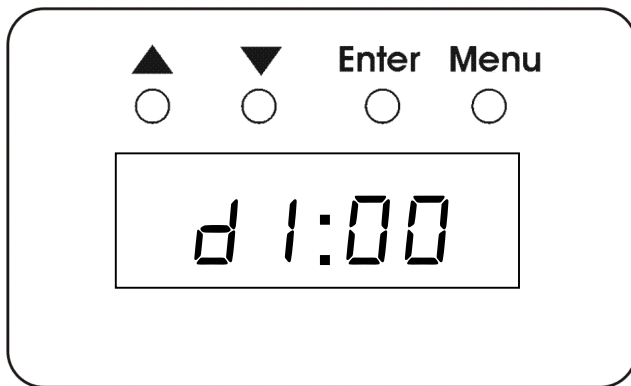

If there is no DMX present, the 'd' letter will disappear, and a '-' will be shown instead:
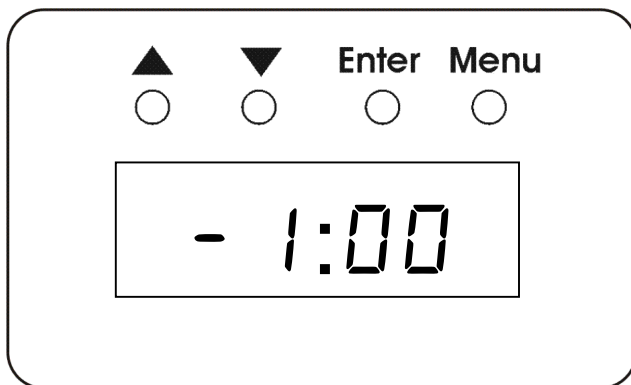
Once the input levels for all dimmer channels have been shown, the display will then indicate the output level for each channel. This is indicated by the letter 'o' in the display, followed by channel number, followed by output level. Output will be shown as a percentage, with 100% indicated b the letters 'FF'

Pressing the ENTER, UP or DOWN keys stops the auto cycle mode and enters manual mode. Pressing MENU toggles between auto and manual cycle modes.

In manual mode the menu steps through its displays when the UP or DOWN keys are pressed. The colon is steady in manual mode.
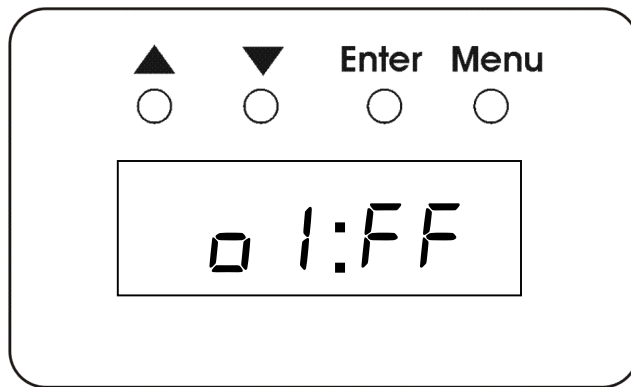
If a channel has been set to a fixed level in the Channel menu, the output status will reflect that level. In this case, the input for channel 1 could be zero, but there could be a non-zero output level.

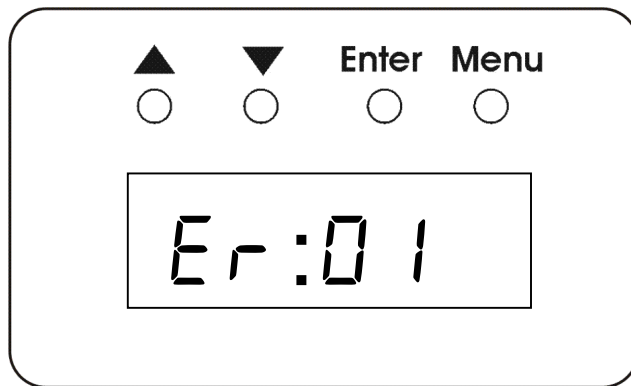| Status Letter	Description
–	No input detected
d	DMX is input source
o	Output level
F	Output Fault – Overtemp or Overvoltage shutdown

Note:
The unit can be Reset to original factory settings by depressing and holding the ENTER switch while turning on the first breaker.

Configuration Data

If you press the Menu button while in the status display, various factory configuration data will be seen. These features are not fully defined at this point, but include software version, power configuration, and analog calibration data for the microprocessor.

6) Error conditions

The ULD-360 will protect itself if the line voltage or operating temperature exceeds safe limits. In these cases, the dimmer will turn off all channels, and display an error message on the display:

```
        ▲      ▼    Enter  Menu
        ○      ○      ○      ○

        ┌──────────────────────┐
        │                      │
        │    Er:01             │
        │                      │
        └──────────────────────┘
```

Error 01 is displayed for an overtemperature condition.
Error 02 is displayed for an overvoltage condition.

The dimmer will return to normal operation once the fault is corrected.

NOTE: Extended operation with Overvoltage applied can cause damage to the dimmer power supply.

7) Service

Service policy

The LD360 DMX is designed for a long, trouble free life. If you suspect that you have a dimmer problem, the first step is to check all other system components and connections. The easiest test is to substitute a known good dimmer in place of the suspected unit. Make sure that the DMX start address is set to the same value.

Specific problems and solutions are listed below:

Problem	Indication	Solution
no power	breaker not lighted	check incoming power
No response to DMX	Display shows D, but no output	Level set in Channel menu Clear dimmer and recheck.
Shorted load	breaker trips	repair instrument or cable
No DMX signal	Display shows A	Check cable and controller
SCR failure	Channel stuck at full	refer to service center
Over Temp	Error 01	Check airflow
Over Voltage	Error 02	Check power wiring
Overload	breaker trips	check wattage of loads

If a problem is verified in the dimmer pack, contact your Leprecon dealer for service. Because of the high voltages present inside of the dimmer, it is important that all service be done only by qualified personnel. Substandard repairs can create a dangerous condition.

Warranty Information

For a period of two years from the date of sale, Leprecon LLC will replace any defective parts and will repair any defective module returned to the factory prepaid, without charge for parts or labor. Damage caused by misuse, incorrect line voltage or connection to shorted loads is not covered under warranty.
Please consult your dealer for full warranty details.

The Leprecon service department may be reached at 810-231-9373 during business hours, or a message may be left after hours. Our fax number is 810-231-1631.

Our service department must first authorize any return to the factory. Do not return any equipment without calling for an authorization number.

8) DMX 512 Information

The following information is a summary of the USITT 1990 standard for dimmers and controllers. A complete copy may be obtained from:

> USITT
> 10 W. 19th ST.
> Suite 5A
> New York, NY 10011-4206

Several web sites exist that have an abundance of information regarding DMX-512. As with any Internet information, consider the source.

The DMX 512 standard is designed as a simple, reliable system for connecting digital dimmers and controllers. The protocol allows up to 512 dimmers to be connected to a single control console. With 512 dimmers in a system, DMX 512 allows each dimmer level to be updated 44 times each second.

Connectors

The DMX standard specifies the use of 5 pin XLR connectors. DMX 512 currently uses 3 pins of the 5 pin connector. Pins 4 and 5 are reserved for future use. Some manufacturers are using these pins for communications back from the dimmer to the control console, or as a redundant data line.

The connectors to be used for DMX 512 are as follows:

> Console end (transmitter)   Female 5 pin XLR
> Dimmer end (receiver)   Male 5 pin XLR

Some manufacturers of XLR connectors are Switchcraft and Neutrik.

Cable type

Shielded twisted pair approved for EIA-422/EIA-485 use. Either one pair with shield or two pair with shield may be used. Examples of such cable are:

> Single pair: Belden 9841, Alpha 5271
> Two pairs: Belden 9842, Alpha 5272

The Pin Designations for DMX 512 are as follows:

> Pin 1   Signal common (cable shield)
> Pin 2   Data 1-
> Pin 3   Data 1+
> Pin 4   Spare, optional Data 2-
> Pin 5   Spare, optional Data 2+