Software Release Note
RD-002-05

Project Title: EKO / e24 / TEKO Dimmer

Software Released by:	Dejan Deletić
Created:	10 February 2006
Last Modified:	4 March 2015

This document is a cumulative list of bug fixes and feature enhancements for EKO V2/V3 family of products.

This upgrade is for use in the following products:

- EKO V2 hardware   (Wall mount 6, 12, 24 Channel Dimmer)
- e24v2 and e24v3 hardware   (Rolling Rack 24 Channel Dimmer)
- TEKO all models   (3U Rack Mount 3, 6, 12 Channel Dimmer)

Notes:

1. This software will not operate on EKO V1 or e24 V1 hardware. If you are unsure which version of hardware you have, please contact your local distributor before attempting an upgrade.
2. References in the rest of this document that refer to EKO are also applicable for TEKO and e24.

This latest EKO software is an evolution of the original EKO software, with the addition of support for LSC Net and Memory Playback and now RDM, TruPower and Circuit breaker monitoring. Some of these features are hardware specific and will not work on your dimmers unless you have the required hardware fitted. If you are unsure if your EKO supports the features you desire, contact your distributor. If your EKO is already running V2 or V3 software then you may upgrade to this version if you feel this is appropriate, or if you have been advised to do so.

Please see Appendix A at the end of this document for details on how to upgrade the software.

Reporting Bugs

If you find a bug, or feel that we could improve the dimmer then please let us know. If you find a bug that affects operation or crashes the unit then could you let us know ASAP!!

email	techSupport@lsclighting.com.au
phone	+61 3 9702 8000
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Operators Manual

The latest version of the Operators Manual is available at

http://www.lsclighting.com/help-centre/downloads/EKO-Installation-Dimmer/

Obtaining Updates

If you wish to be emailed about EKO software updates as they are released then send an email to the above address and you will be added to the mailing list.

Upgrading to this Version

Internal changes may have been made to how the Dimmer Type (EKO6, EKO12 etc) and Dimmer Voltage are stored. In addition the Dimmer Channel Type (Dim, Switch) may now be configured as well as whether or not LSCNet is enabled and whether or not the Real Time Clock is enabled. All of these features are accessed via the Service Menu. What changes have been made are dependent on the version you are upgrading from.

Downgrading from V3.0x to V2.xxx when TruPower is fitted

If for whatever reason you want to go back to version V2.xxx ensure TruPower is disabled for both modules from the Service Menu before loading V2.xxx software, otherwise an incorrect Dimmer type will be selected and it will not be possible to change it. Should you end up with this scenario, upgrade back to V3.0x, disable TruPower for both modules from the Service Menu, then reload the desired V2.xxx software.

Upgrading from version 2.1.0.0 and later

This should be a straightforward upgrade, with no data loss or need for reconfiguration of the dimmer. Ignore the rest of this paragraph

Upgrading from version 2.0.0.9, 2.1.0.0b

You should be able to upgrade from EKO 2.0.0.9 to this version with no data loss. However we suggest first making a note of the Dimmer Type, Dimmer Setup, Channel Setup, Net Setup, Patch and Memory programming before you upgrade to be sure that you can restore the state of the dimmer after upgrading should anything unexpected happen

If you have had problems where editing one memory affects another then we suggest you install this version and perform a Total Reset to prevent the problem continuing. In this case you will need to make a note of the dimmer configuration as suggested above.

There are a very small number of installations running 2.1.0.0b. If you install this version on top of 2.1.0.0b you will have to set the dimmer type (EKO6, EKO12 etc) in the Service Menu as the Dimmer Type may be changed back to EKO6.

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Upgrading from version 1.0x

Note that you can only upgrade from 1.0x to 2.1 if you have a CPU card revision EDIMP05Cx.pcb or later (Hardware Version 2). The revision text is located under the LCD, to the left of the LCD ribbon cable.

If you have a CPU board revision EDIMP05Bx.pcb or earlier, you must install the 1.0x software stream.

Upgrading to this version will lose the existing configuration of the dimmer. We suggest you record the configuration of the dimmer, (Dimmer Type, Channel Setup, Patch, Backup Scene) upgrade the firmware, and then reconfigure the dimmer.

After Upgrading to this version

Because there is new dimmer configuration data we recommend checking how the Dimmer is configured in the Service Menu.

To access the Service Menu, Reset the dimmer and then:

- If your dimmer is an EKO - Press in the middle of the O of EKO
- If your dimmer is an TEKO - Press in the middle of the O of TEKO
- If your dimmer is an e24 – Press in the enclosed section of the 4 in E24

This brings up the Service Menu. Press the Setup Button to access the Setup Menu.

Check that the model matches the model you have just upgraded. If it doesn't press the Model button and select the appropriate dimmer model.

Check that the Dimmer Volts is set appropriately. (No harm will occur if you set this inappropriately; the worst that will happen is that the 120V curve will be hidden in the curves menu).

Verify that the channel type matches the channels as installed in the Dimmer. If they don't, then set them appropriately.

If no LSCnet Power Supply is installed or you do not require LSCnet functionality then set Net Enabled to False.

If you are having issues with the Real Time Clock, Disable it.

Release: v3.08   Date: 04-Mar-2015

Revised Features:

- Enabled TruPower setting for TEKO6 model.

Release: v3.07   Date: 12-Jan-2015

Bug Fixes:

- LCD initialisation performed always, even if already done by the bootloader
- When the touchscreen is tapped, the unit will produce short 'tick' sound if unable to communicate with the touchscreen device.
- Improved SPI bus arbitration to resolve spurious screen lock-ups.
- Fan operating range changed to 50-65°C.
- Improved fan speed calculation.
- Beeper re-write – attempt to fix occasional spurious never ending beep.
- Corrected TruPower Non-Dim hysteresis operation.
- Corrected battery voltage reading and reporting.

New Features:

- Implemented L-curve
- RDM: added support for sub-devices

Revised Features:

- Real Time Clock and Asymmetry alarms have been removed.

Release: v3.06   Date: 29-Jun-2012

New features added:

- New EKO model added (EKO506)

Release: v3.05   Date: 27-Jul-2011

Bug fixes:

- Fluoro curves threshold has become Minimum level bug fixed (Mantis 1115) has been fixed.

Release: v3.04   Date: 07-Mar-2011

Bug fixes:

- Memory fade times now save correctly.
- Circuit Breaker State detection filtering improved.
- Max level no longer ignored when Fluoro curve selected.
- Beeper "stays on" bug fixed.
- Memory 80 now can be played.
- Memory Copy button musk no longer persistent between Bank screens, (it is now possible to copy memory 1 to memory 21, 41 or 61)

New features added:

- Fade curve image added to show transfer characteristic when selecting curve type.

Release: v3.03   Date: 14-Sep-2010

New features added:

- TEKO/10 and TEKO/20 added to Dimmer Models (both support TruPower)
- EKO312, EKO324, EKO512, EKO524 and TEKO/12 now also support TruPower

Release: v3.02   Date: 18-Jun-2010

Bug fixes:

- I2C problem on C2 cards fixed.
- DMX loss alarm timeout fixed.

New features added:

- EKO212 and EKO224 models added (both support TruPower).
- TruPower alarm added.
- CB status button inactive if no TruPower modules detected.
- CPU H/W version added to about dialog.
- RTC battery voltage added to Module status screen (C3 CPU cards only).
- Blind record and edit added to memory dialog.
- Play and release memory added to memory dialog.

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Release: v3.01   Date: 02-Mar-2010

NOTE: this is a Job specific release and may not run on all hardware. Please contact LSC before upgrading.

Bug fixes:

- The dimmer would reset when issued with GetDeviceInfo RDM command. This version fixes this problem.

Release: v3.00   Date: 24-Feb-2010

NOTE: this is a Job specific release and may not run on all hardware. Please contact LSC before upgrading.

Bug fixes:

- Changed TEKO3 rating from 15A to 63A
- Fixed TEKO3 patch screen
- Fixed UI crash on dimmers with LSCnet enabled. This can occur on dimmers that have been running for a long time when the UI is being used. Increased top of memory by 128k bytes to fix memory over-run.
- Pulse transformers drive frequency changed to 24Khz.
- Fixed problem where on total reset channel reverted to S-curve even when set to switch type.

New features added:

- RDM support has been added. The dimmer will now respond to RDM messages.
- TRU power functionality has been added. (This requires TRU-POWER enabled firing card)
- Circuit Breaker monitoring has been added. (This requires TRU-POWER enabled firing card)
- New SPI touch screen controller support has been added to improve touch-screen response. (This requires CPU card version C3 or newer)
- DMX address added to the main screen. It now displays the start DMX address if patched 1-to-1 and 'Patch' if DMX is patched.
- Fluoro Curve added.
- Improved firing algorithm. Now pulse transformer signal is turned off by software as well as the zero-cross leading edge (whichever occurs first)
- Fan control algorithm modified to run the fan at 40% when 4 or more TRU-POWER relays active.

Release: v2.34   Date: 15-Sep-2008

- The 2 temperatures sensors (left & right) will give different temperature readings because they are located differently, in this version the over temperature trigger points and fan speeds are adjusted
- for when the sensor is physically located on the right to take into account the 10 degrees difference in readings.
- MANTIS entry 615, 'Uninitialised data in DMX buffer when using the patch which shows up on the display' has been fixed.

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Release: v2.33   Date: 24-Jun-2008

- DMX packets with less than 512 slots is now handled correctly
- Relay On Threshold changed from 4 to 5%
- For NonDim and Relay curves in previous versions output levels where defined by the minimum and maximum values for a channel, they are now set only to zero or full.

Release: v2.32   Date: 23-Jun-2008

- Improvement in Zero Cross detection means it will be less likely that phase will be lost due to noise on zero cross detection.
- Non-zero DMX start code is no longer considered an error as this can indicate an RDM packet
- Problem that could occur when number of DMX slots sent by DMX source was less than 512 and DMX connector removed-reinserted, has been fixed
- Error causing show file transfers to fail has been fixed
- In XML Show files DMX address is now 1 based (previously 0 based)
- Outputs are now disabled correctly during a show transfer (upload)

Release: v2.30   Date: 28-Feb-2008

Features Upgraded:
- Improving software robustness.
- Significant changes to the way LscNet communications are handled.
- Re-write of logging system

Release: v2.25   Date: 18-May-2007

A grounding problem mainly affecting the TEKO and e24 (LCD version) dimmers has been recently discovered (potentially it could also occur on any of the EKO family members). The grounding problem makes the i2C bus sensitive to noise, and therefore unreliable. If communication with the temperature sensor is lost for more then 5 seconds, then the dimmer will set all the outputs to off. Once the noise has passed, communications with the temperature sensor is re-established and the dimmer resumes normal operation. The result is that the channel outputs appear to flicker.

The dimmer will also report Temperature Sensor or Real Time Clock error message in the log. This problem affects all EKO family dimmers with PCB version C2 (EDIM05C2.pcb) or earlier. Changes have been made to the code so that if there is a temperature sensor failure (or error in communication) the outputs are no longer switched to zero. Instead the fan(s) is(are) switched to full and the error reported in the log and via Houston (if connected). Whilst this problem

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is due to incorrect mounting of the CPU card, the software nevertheless has been changed to ensure that the system will continue to work.

Release: v2.24   Date: 17-May-2007

Further change to Active Current Control.

- Pre-heat levels changed to average out the inrush current. (i.e. faster response then using the older pre-heat algorithm).

Release: v2.23   Date: 30-Apr-2007

Improved Active Current Control.

- Pre-heat levels changed.

Improved DMX error detection.

- The dimmer will reject DMX packets of inconsistent size (for example: corrupted due to intermittent connection).

Release: v2.22   Date: 19-Apr-2007

Intermittent flicker problem at low channel levels fixed.

- This problem is only seen when one or more channels are set to levels around 4%.
- The firing code has been modified to remove the offending race condition.

Release: v2.21   Date: 16-Mar-2007

- Improved touch screen calibration.
- Improved Active Current Control.
- Pre-heat time increased.

## Release: v2.20   Date: 06-Mar-2007

- Version numbering format changed

Release: v2.2.0.0   Date: 22-Jan-2007

New features:

- Improved Zero Cross pulse detection Code:

   The maximum zero cross pulse width is now 1.8ms.

- Added Support for Status Monitoring and Alarm Reporting to Houston:

   Support to report Device Information and Alarm Status have been added and Status Reporting has been extended. This is to allow the Dimmer to work with Houston, LSC's Network Status Monitoring Application. For more information on Houston contact your local distributor.

- Added ability to change the Dimmer Name in the Options Menu.

   A descriptive name of up to 12 characters can be entered. This name is displayed on the Status Screen, and by Houston™.

- The Dimmer can report an abort code, if any, that caused the previous CPU reset.

   This is a fault condition that is reported by Houston™.

- A DMX/Thermal/Phase alarm can be simulated remotely.

   This allows these alarms to be simulated from Houston TM for demonstration and test purposes.

- DMX/Mem Switch Terminology .

   What was previously known as the Mem/DMX switch is now known as the DMX/Mem switch. This reflects its usage priority in most installations.

- Dimmer Channel Source is shown below Bargraph on Status Screen.

   The channel source is shown as either

      D : DMX

      B : DMX Backup

      M : Memory

   If the channel source is via the DMX/Mem switch the source text is shown as inverted text.
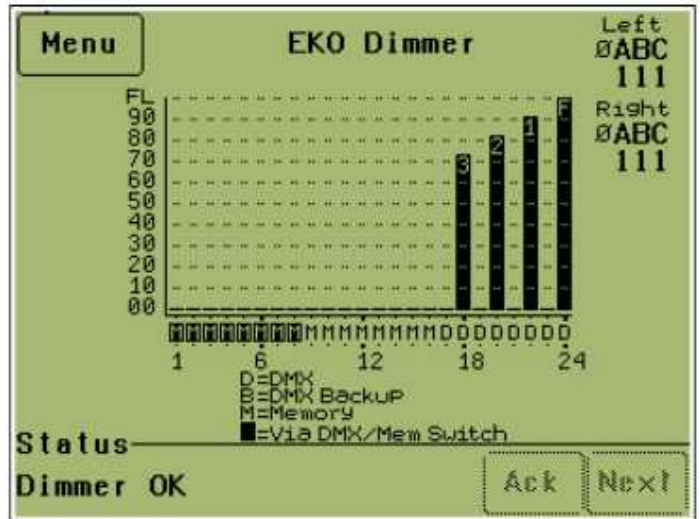
In the example above channels 1 to 8 are switched via the DMX/Mem switch, which is currently switched to Memory source. Channels 9 to 17 are sourced from Memory. Channels 18 to 24 are sourced from DMX, which is connected.

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- The channel setup menu has been reworked.

  All channel properties can now be viewed and manipulated in the Channel Setup menu. These are:

  Control Source, Min Level, Max Level, Fade Curve, Net Master Group.

  Net related functions are not shown if LSCNet is disabled, and disabled if Net Playback is disabled.

- The DMX Input Menu has been simplified and consolidated.

  All functions directly relating to DMX have been placed in the DMX Input Menu.
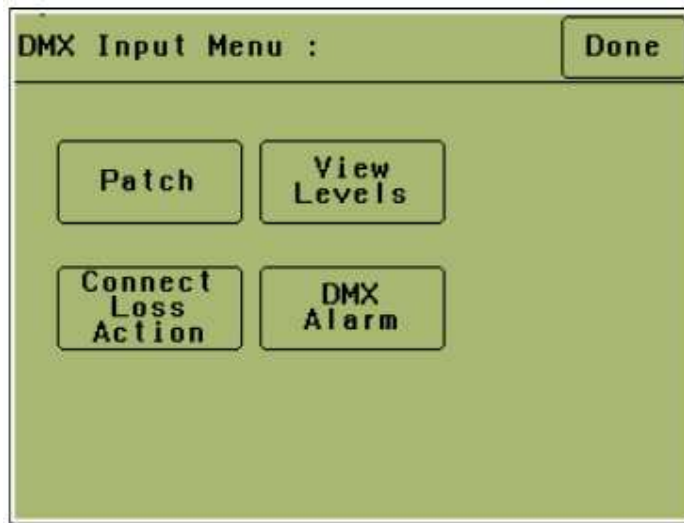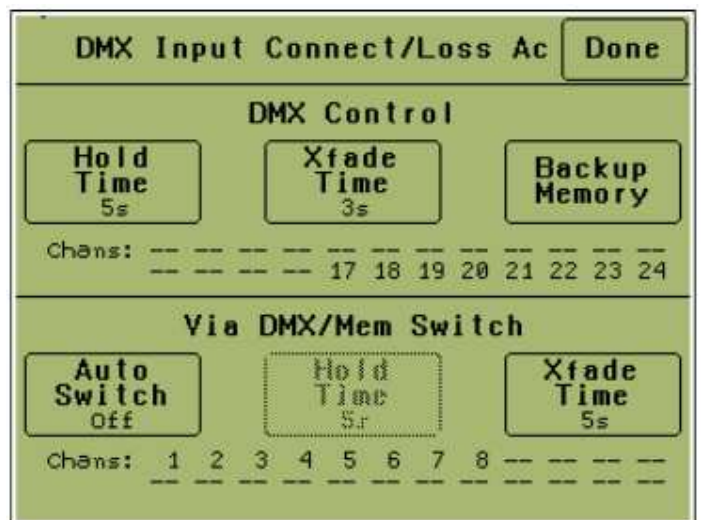

- DMX Alarm

  The DMX Alarm can be enabled, disabled from here, and the alarm delay can be set. For further details refer to the manual.
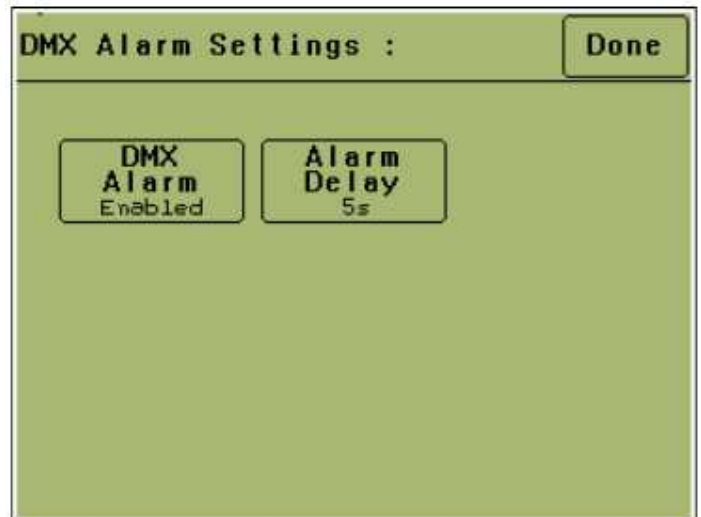
- The Connect/Loss action menu appearance will depend on whether or not LSCNet is enabled, and whether or nor Net Playback is enabled. If both are enabled it looks like this:

  The Hold Time, Xfade Time may be set for the DMX Control Source.

  The Auto Switch function, Hold Time and Xfade Time may be set for DMX control via the DMX/Mem switch.

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- The broadcasting of Log Entries by the dimmer has been removed.

  This functionality has been superseded by the improved status and alarm reporting provided by Houston™.

- EKO512 and EKO524 have been added as model selections.
- The Numeric Keypad has been cleaned up on the Virtual Keyboard.
- The Status Display Bargraph Level Digits have been cleaned up.
- A test has been added to the Diagnostic menu to test the DMX and LSCNet terminator switch.

Bug Fixes:

- Manual Setting of Hardware Address.

  If LSCNet was not enabled the dimmer would not remember its new hardware address . This has been fixed.

- Dimmer broadcast "Switch To Memory" command at Power Up.

  When a dimmer was powered up or reset it would broadcast a command for other dimmers to switch the DMX/Mem switch to Memory playback. This has been resolved.

  Now, at power up or reset the Dimmer queries the state of the DMX/Mem switch of any attached devices. If a reply is received it takes on this state. If no reply is received it takes on the state it had when it as last powered down.

- Dimmer Channels not correctly switched between DMX/Mem source.

  This would only show when dimmer channels were not sourced from the DMX/Mem Switch, the Switch Source was changed, and then the channels were switched to the DMX/Mem Switch.

- Channel Source not updated when DMX, DMX/Mem Hold Time Changed

  This would show when Hold Times for DMX Control and DMX/Mem Switch Control were changed. Channels sources (DMX, DMX Backup, Mem) were not updated to reflect the new state. This has been fixed.

- Memory Leak on Memory Playback Command.

  It was possible for the dimmer to crash if it received multiple commands under certain circumstances. This has been resolved.

Release: v2.1.0.3   Date: 02-Oct-2006

New Features:

- Completed support for TEKO Dimmer:

  Added graphics for TEKO logo. Removed Choke Rise Time numbers.

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Release: v2.1.0.2   Date: 17-Jul-2006

New Features:

- CPU Board Hardware Address:

    The CPU Hardware Address is now shown on the Splash Screen and the About Box. The Hardware Address button has been removed from the Net Setup menu, and moved to the Service Menu.

- Screen Background is checker boarded when an Alert is shown.

    This is to make the Alert stand out from the rest of the screen.

- LSCNet Stalled Alarm.

    If it is not possible to broadcast traffic onto the net the Dimmer will flag that the network is stalled with an Alarm. This may be caused by no power supply to the net transceiver, or a termination or cabling problem. If you receive this alarm contact your LSC Distributor or LSC.

Bug Fixes:

- Packet Handling is now in background loop.

Release: v2.1.0.1   Date: 13-Jun-2006

New Features:

- DMX Alarm can be disabled from DMX Menu:

    If you don't want an alarm posted when DMX is lost you can disable the DMX alarm from the DMX menu.

- Log is persistent:

    The contents of the log are maintained across resets. In addition the log size has been increased to 2048 characters. The log timestamp now shows the month and day that the event occurred, as well as the time, in a format mm/dd hh:mm:ss

    The contents of the log are cleared when a total reset is performed.

Bug Fixes:

- I2C Handler is more robust.
- Dimmer Config loading at startup is more robust.
- Right Module Temperature Probe is only sampled when required.

Release: v2.1.0.0   Date: 18-May-2006

New Features:

- Channel Type Menu in Service Menu.

    When requested LSC can supply dimmers with no chokes, where their intended use is as a Switch. The Channel Type Menu allows for the configuration of channels as Dim channels or Switch channels. When a channel is configured as a Switch the Min & Max Level are fixed at 0 & 100%

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respectively and only Non Dim or Relay curves may be applied to them. The Channel Type configuration is maintained across Total Resets.

The channel type configuration is initialised to all set all channels as Dim channels when the Dimmer Model is changed in the Service menu.

This menu is typically for use by LSC manufacturing.

- LSCNet Enable/ Disable Button in Service Menu.

  The EKO may be configured to run without LSCNet. If it is configured to work without LSCNet then the Memories and Net Setup menus are not shown on the main menu and the dimmer will not communicate on the network. This would be the case when a customer orders an EKO without an LSCNet power supply.

  The Enabled/Disabled state is maintained across Total Resets.

  This menu is typically for use by LSC manufacturing.

- Real Time Clock Enable/Disable button in Service Setup Menu

  If the RTC is enabled it serves as the time source for the EKO. Date/Time alarm messages will be shown as normal.

  If the RTC is disabled the EKO keeps an internal clock that starts at 00:00:00 when the EKO is turned on, and the Button to set the Date/Time is removed from the EKO menu. No Date/Time alarm messages will be shown. An alarm will be posted if there is no connection to the RTC, but if that happens then other bad things will be happening too.

  To Enable/Disable the RTC access the Service Menu (by pressing and holding in the 'O' of EKO on the splash screen as the EKO boots). Press the Setup Button. Press the RTC button to toggle the Enabled/Disabled state.

  In addition the RTC initialisation has been revisited (again). The RTC is set to its lowest power consumption mode as the EKO starts up. There is no need to reset the date or time for this to occur.

Revised Features:

- Net Playback Menu Changes

  The Net Playback Button has been moved from the Net Setup Menu to the Options Menu. The Memory and Net Setup Menus are dimmed if Net Playback is disabled.

- The Net Setup Menu has been rearranged a little.

  The Net Playback button is no longer present. The Memory/Dmx switch manual control has been moved to the first row of buttons.

- Snap DMX Channel Level Options Alert.

  When snapping DMX levels when editing a memory an alert is now presented that gives the option of snapping selected channel or all channels.

Bug Fixes:

- Changes made to eliminate channel flicker and spurious Phase Fail Alerts.

  Changes to interrupt priority have been made to stop channel flickering in some circumstances, as well as the spurious Phase Fail alerts.

- Changes made to Code Timer and Interrupt Handling to improve reliability.

  High level code now uses a common background process. Interrupt priorities have been optimised.

- Changes made to Memory Storage.

  Memories now correctly save to flash memory if they are changed.

- Dimmer Voltage is retained across Total Resets.

  If you performed a total reset the Dimmer Voltage was reset to 240. Not so good if it was set to 110. This has been fixed.

- Memory Playback

  The dimmer will correctly restore the last memory playback state if the dimmer is turned on within two hours of losing power.

- DMX/MEM Switch

  Changes have been made to make this work correctly in all circumstances.

- Writes to Flash Memory Are Quicker, More Reliable

- The DMX Backup Scene is no longer initialised to have all channels at full.

  This was a hangover from V1 firmware.

- References to EKO have been removed from the Service Menu.

- DMX /Memory Switch

  The DMX/Memory switch now works correctly on Connect/Disconnect of DMX and when responding to external DMX Enable messages.

- Memory Playback

  The dimmer will now correctly restore the last Memory Playback channel state if it is turned on within 2hrs + 15m of being turned off. This is achieved by writing the current time at 15 minute intervals to Flash Memory.

Release: v2.0.0.9   Date: 15-Feb-2006

New Features:

Added support for Relay Dimmer Curve. This is a switched dimmer curve with hysteresis that switches on at 4% control input, and switches off at 2% control input. Use this curve when you want relay functionality from a dimmer channel. Note that the normal restrictions still apply to the kinds of loads the EKO may drive.

Revised Features:

Changes to the way Max Level & Min Level work for dimmer channels. Min & Max Level are used to apply limits to, and scale, the control input. For a given control input, the control output after scaling will be in a range proportionately between Min & Max Level. It is now possible to set Max Level less than Min Level. This results in a control output that behaves in the opposite sense to the control input.

Detail changes to the Channel Setup Menu. No channels are selected on entry to the menu.

Real Time Clock registers are now initialised correctly when the time or date is set. Please reset the time on the dimmer (setting the seconds will do the trick) if you are upgrading from a version prior to 2.0.0.9. This should stop spurious RTC alarms.

The Default Time for DMX Input to hold DMX levels on loss of DMX has been changed to Infinite. This mimics other DMX dimmers that we manufacture.

Release: v2.0.0.8   Date: 27-Jan-2006

- Support for TEKO added

Release: v2.0.0.7   Date: 27-Jan-2006

- First production release.

Appendix A: Installation procedure

To install a software update, perform the following steps:
1. Download the updated EKO code from our website.
2. Use the CodeLink support program available from LSC (http://www.lsclighting.com/help-centre/downloads/CodeLink/).
   Use CodeLink 1.1.02 or later.
3. Start CodeLink and follow instructions displayed by the program.
4. Once complete, the unit will start automatically.