DTU Physics
Radiation Instruments

Technical Note

Subject: Revision history for Risø TL/OSL Software

Distribution CD/USB memory stick

Package	Description	Date/ Responsible
2024-D	New Sequence Editor v4.74.	21/5-24/KARB
2024-C	New Sequence Editor v4.73.	7/5-24/KARB
2024-B	New Sequence Editor v4.72. MiniSys software updated to V4.22.	30/4-24/KARB
2024-A	New Sequence Editor v4.71. WinUSB driver for Amptek Mini-X2 added.	26/1-24/KARB
2023-D	New Sequence Editor v4.70.	8/12-23/KARB
2023-C	New Sequence Editor v4.69.	27/11-23/KARB
2023-B	New Sequence Editor, Control Program, Viewer+, and Viewer v4.68.	2/10-23/KARB
2023-A	New Sequence Editor and Control Program v4.67.	23/3-23/KARB
2022-A	New Sequence Editor v4.66.	29/11-22/KARB
2021-A	New Sequence Editor v4.65. New MiniSys v4.21. New XRFanalyse v.1.14. New Viewer+ 4.65. PVCAM driver for EMCCD imaging updated to version 8.2.1373.0. Do not use this driver to upgrade existing installations. It is not compatible with older cameras.	18/5-21/KARB
2020-E	New Sequence Editor and Control Program v4.64.	8/7-20/KARB
2020-D	Same as 2020-C except for alternative Sequence Editor and Control Program v4.63 that will run on Windows XP. This special release is intended for PCs with the Ortec photon timer card that only works with Windows XP.	11/3-20/KARB
2020-C	Setup for new Mini-X2 Controller added to installer. Automatic install of old Mini-X Controller removed from installer. New Sequence Editor v4.62. New MiniSys v4.19.	10/3-20/KARB
2020-B	New Sequence Editor v4.61. New Control Program v4.61. New MiniSys v4.18.	19/2-20/KARB
2020-A	New Sequence Editor v4.60. New PTanalyse v.1.55. New MiniX2.dll for control of Amptek Mini-X2 from the Sequence Editor.	23/1-20/KARB
2019-H	Disabled the Sequence Editor programmer's log ("C:\Risoe logs\SeqEd.log") as default, again. It was enabled in version 2019-G.	7/11-19/KARB
2019-G	New Sequence Editor and Control Program v4.59	30/10-19/KARB
2019-F	New Sequence Editor and Viewer+ v4.58.	1/10-19/KARB
2019-E	New Sequence Editor v4.57. New PTanalyse v1.54. New TimeHarp 260 photon timer driver.	24/9-19/KARB
2019-D	New Sequence Editor v4.56. New Viewer+ 4.56. New MiniSys v4.16	24/6-19/KARB
2019-C	New Viewer+ v4.55.	30/4-19/KARB
2019-B	New Sequence Editor v4.54.	5/3-19/KARB

2019-A	New Sequence Editor and Control Program v4.53. Spectrometer grating definitions added to R_FLTDET.INI. New Analyst v4.57. New MiniSys v4.14. New Andor SDKs. New sample camera device driver.	16/1-18/KARB
2018-C	Sequence Editor and Control program updated to V.4.52. MiniSys software updated to V4.13. XRFanalyse updated to V.1.13. Analyst updated to V.4.53.	22/11-18/KARB
2018-B	Sequence Editor and Control program updated to V.4.51. MiniSys software updated to V4.10.	21/2-18/KARB
2018-A	Sequence Editor updated to V.4.50.	10/1-18/KARB
2017-D	Sequence Editor and Control program updated to V.4.49. The installer now gives the Windows group Everyone full access rights to C:\ProgramData\Risoe.	22/11-17/KARB
2017-C	Sequence Editor and Control program updated to V.4.48. Please upgrade these programs together; otherwise the max baud rate change can give connection problems when you switch between them. PTanalyse updated to V.1.53.	8/9-17/KARB
2017-B	Sequence Editor and Control program updated to V.4.47.	1/5-17/KARB
2017-A	Sequence Editor and Control program updated to V.4.46. PTanalyse updated to V.1.52.	19/4-17/KARB
2016-F	Sequence Editor updated to V.4.45.	7/12-16/KARB
2016-E	Sequence Editor updated to V.4.44. RLanalyse updated to V.1.30.	26/10-16/KARB
2016-D	Sequence Editor, Viewer+ programs are updated to V.4.43. PTanalyse is updated to V.1.51.	24/8-16/KARB
2016-C	Sequence Editor, Viewer, Control and Viewer+ programs are updated to V.4.42. Fixed problems of previous version of running on 32-bit and Windows 10 systems. Matlab runtime and EMCCD example data removed from installer. They can downloaded from www.nutech.dtu.dk	16/3-16/ TLAP,KARB
2016-B	Sequence Editor, Viewer, Control and Viewer+ programs are updated to V.4.41. PTanalyse is updated to V.1.50. XRFanalyse is updated to V.1.12	9/3-16/ TLAP,KARB
2016-A	Sequence Editor, Viewer and Control programs updated to V.4.40, MiniSys/Controller program is updated to V.4.08, Analyst is updated to V.4.31.9. The ViewerPlus program has been added. As the V8 bin file format has been introduced the PTanalyse is updated to V.1.48, RLanalyse to V.1.21 and XRFanalyse to V1.11 to be able to read the V8 bin file format	10/2-16/TLAP
2015-G	Sequence Editor updated to V.4.36, MiniSys/Controller program is updated to V.4.06	5/10-15/TLAP
2015-F	Sequence Editor and Control Program are updated to V.4.35	5/7-15/TLAP
2015-E	Sequence Editor is updated to V.4.34 and PTanalyse is updated to V.1.47. Firmware for DASH driver board and DASH controllers and upload Flip upload tool is added to the installation.	8/6-15/TLAP
2015-D	Sequence Editor, Viewer and Control Program are updated to V.4.33	13/5-15/TLAP
2015-C	Sequence Editor, Viewer and Control Program updated to V.4.32. Analyst is updated to V4.31.7 and XRFanalyse and Amptek XRF standard programs are added to the software package	17/4-15-/TLAP
2015-B	Sequence Editor, Viewer and Control Program updated to V.4.31 and manual for Automated DASH (new OSL head) included. Also some errors in the generation of shortcuts and extension assignment in 2015-A were corrected	10/2-15/TLAP
2015-A	Sequence Editor, Control Program, Viewer Updated to V.4.30, and PTanalyse to V.1.45- to support new automated Detecction And Stimulation Head (DASH)	22/1-15/TLAP

2014-D	Sequence Editor and Viewer program is updated to V.4.29. PTanalyse is updated to V. 1.44 File association for .bin, .binx, .sec, and .seq are made during installation (by an mistake it has been removed in 2014-A to 2014-C)	11/12-2014/TLAP
2014-C	Sequence Editor and Control program is updated to V.4.28. Minisys program is updated to V.3.35	17/9-2014/TLAP
2014-B	Sequence Editor and Control program are updated to V.4.27	13/6-2014
2014-A	Sequence Editor is updated to V.4.26, Controller program to 3.31, and Comments in USERMSLL.CMD are updated. Analyst is updated to V.4.14.6.	2/6-2014
2013-G	Control program, Viewer and Sequence Editor updated to V.4.25. Folder for USB driver for the controller renamed from "*CDM*" to "*ControllerUSBdriver*"	6/12-13/TLAP
2013-E	Control program and Viewer updated to V.4.24	14/11-13/TLAP
2013-E	Sequence Editor is updated to V.4.24	5/9-13/TLAP
2013-D	Sequence Editor, and Control program are updated to V.4.23, and Analyst is updated to V.4.12.	13/8-13/TLAP
2013-C	Sequence Editor, and Control program are updated to V.4.22, PTanalyse to V.1.42. Update installer has been removed from the distribution, as Controller software upload is now possible from the Control program. Photon Timer manual has been updated.	17/4-13/TLAP
2013-B	Sequence Editor, Viewer and Control program are updated to V.4.21, PTanalyse to V.1.41, and Analyst to V.4.11. Furthermore a CA command has been added to the SGLMOSL command. The PTanlyse manual has been updated to also cover the TimeHarp 260 board	3/4-13/TLAP
2013-A	Sequence Editor, Viewer and Control program are updated to V.4.20, PTanalyse to V.1.40, RLanalyse to V.1.10 , and Analyst to V.4.10. All the above files now support the extended bin-file format (binx). Manual for the Sequence Editor and the Viewer has been added. File association for .bin, .binx, .sec, and .seq are made during installation	21/2-13/TLAP
2012-D	Sequence Editor updated to V.4.12. Sample camera run-time ActiveX and driver added to installation	18/9-12/TLAP
2012-C	Sequence Editor, Viewer and Control program updated to V.4.11.	6/7-12/TLAP
2012-B	Sequence Editor, Viewer and Control program updated to V.4.10. Change in SequenceEditor.cfg format (old .cfg file must be deleted)	19/6-12/TLAP
2012-A	Sequence Editor updated to V.4.06 and low-level command file TLMSLL.CMD updated to include all TL modes and correct errors for TL acquisition with temperature plateau. RLanalyse V.1.00 and User Manualreleased	24/2-12/TLAP
2011-F	Sequence Editor and Control programs updated to V.4.05	12/12-11/TLAP
2011-E	Sequence Editor, Viewer and Control programs updated to V.4.04	25/11-11/TLAP
2011-D	Sequence Editor updated to V.4.03	5/9-11/TLAP
2011-C	Sequence Editor updated to V.4.02 Viewer program updated to V.4.02	16/5-11/TLAP
2011-B	Controller software updated to V.3.21 Sequence Editor updated to V.4.01 PTanalyse updated to V.1.21	11/4-11/TLAP
2011-A	Minisys/controller update program updated to v.1.02 Controller software updated to V.3.20 Sequence Editor, Viewer and Control program updated to V.4.00 PTanalyse updated to V.1.20	25/3-11/TLAP

2010-F	Controller software updated to V.3.19. TLMSLL.CMD updated to remove wait for beta source to turn.	29/10-10/TLAP
2010-E	Controller software updated to V.3.18 TLMSLL.CMD corrected to include wait for vacuum ready in alpha irradiation and beta on in beta irradiation. Control Program updated to V.3.39	24/8-10/TLAP
2010-D	Controller software updated to V.3.17.	9/7-10/ TLAP
2010-C	Controller software updated to V.3.16. Sequence Editor and Control program updated to V.3.38. Conroller software update program in a new version is added. Installation of USB driver for Risø Controller/Minisys added	2/7-10/ TLAP
2010-B	V.2.20 of old Minisys I software is added. Installation for all users added as installation option. New Sequence editor V3.37 added.	17-5-10/TLAP
2010-A	New Sequence editor V3.36 added.	12-1-2010/TLAP
2009-F	New Sequence editor V3.35 added. New version of PTanalyse V1.1 has been added and Photon Timer manual	16-11-2009/ TLAP
2009-E	New Version of the Sequence Editor and Viewer V3.34 are included. The program for analysing Photon Timer data PTanalyse V1.0 has been added to the distribution for optional installation	20-10-2009/ TLAP
2009-D	New versions of the Sequence Editor and Control programs (V3.33) are included	31-7-09/TLAP
2009-C	A new version (V3.32) of the sequence editor is included	8-4-09/TLAP
2009-B	Minisys V. 3.15 included that removes the possibility og getting several empty channels when in the bin file when pulsing unit is installed. A truncation that meant that acquisition time was truncated to nearest 0.5 s has been removed. Now acquisition time may be defined with a resolution of 0.01s. This means that also the sequence editor has been changed to V.3.31	13-3-09/TLAP
2009-A	The XY setup file TLOSL.INI is removed from the distribution. . The program automatically creates on if not present, or you copy the one that is distributed with a single grain system. The 'Extras' have been reorganised, old manuals have been removed and new ones added (built-in pulser) The 'extras' now includes an 'Instructions' directory including Temperature calibration.pdf and linearity.xls. Linearity should is 'streamlined' and now includes instruction of use. A new version of the CAL.SEQ has been added.	13-2-09/TLAP
2008-D	New version (3.14) of Minisys SW included. Illegal remark removed from command file tlmsll.cmd .	24/10/TLAP
2008-C	The installation now contains Sequence Editor, Control Program, Viewer V.3.30	9/9/TLAP
2008-B	The installation now works on Vista based PC's as well Minisys SW V 3.11 included. This included a en end-stop SW filter for the XY option. It also includes a truncation of transmission delay to integer hundreds and limits the delay to > 200µs Control program in V 3.22-2 included. This version limits the transmission character delay to 200-500µs	15-4-08/TLAP

2008-A	The production of distribution disk revised and documented.	28-3-08/TLAP
	Installation of Manual, Extra material (including instruction movies), and Update program (for updating Minisys program) are added.	
	Facility to make customised installation is added.	
	Note: The installation does not work on Vista based PC's	

Sequence Editor

Version	Description	Date/ Responsible
V.4.74	Fixed false 3 minutes time-out in retry mechanism.	21/5-24/KARB
V.4.73	Fixed USB buffer overflow problem in new retry mechanism. Added key-presses for breaking and retrying data download.	7/5-24/KARB
V.4.72	Retry on interrupted data download. Updated tlmsll.cmd to v4.45. New option for log snapshots. Fixed error with Andor EMCCD flipped images. Fixed Andor EMCCD temperature fluctuation. Fixed errors for Photometrics EMCCD, introduced with Andor EMCCD support. Now resetting encoders if XY move is off by more than 10 microns. Option for log entry if moving XY takes more than 20 seconds. Added SeqEd2.log to log4delphi.properties. Fixed error with long-running commands (RS3 interrupting normal communication).	30/4-24/KARB
V.4.71	Fixed Andor spectrometer SetShutter error.	26/1-24/KARB
V.4.70	Fixed orientation of Andor EMCCD images. Fixed saving of Andor EMCCD EM gain setting.	8/12-23/KARB
V.4.69	Small enhancements for Andor EMCCD: Use API to store captured TIF. Option for skipping cooling. Added setting for saving SIF files.	27/11-23/KARB
V.4.68	Updated Custom command JavaScript API to v1.0. Added 'Green LEDs (DASH only)' to the list of bleaching light sources in the Illumination command.	2/10-23/KARB
V.4.67	Added Iris settings to EMCCD setup. Added "Custom" command with JavaScript engine.	23/3-23/KARB
V.4.66	Added Andor iXon 897 as option for EMCCD imaging.	29/11-22/KARB
V.4.65	Added support for Andor iKon-M CCD camera in spectrometer attachment. Fixed TL command heating rate errors when using 9600 Baud. EMCCD aperture range now from 2 to 22. EMCCD SI range now from 1 to 250. EMCCD *Automatic iris* checkbox removed.	18/5-21/KARB
V.4.64	New fAperture field added to BINX file record. It holds the EMCCD focusing unit aperture. The field is for internal use, for now, so the BINX file format version number has not been incremented. Added DASH settings to the User-defined command.	8/7-20/KARB
V.4.63	Since the introduction of the new MiniX2.dll in V4.60 the Sequence Editor will no longer run on Windows XP. V.4.63 is special version where the MiniX2.dll has been temporarily disabled so Windows XP PCs with the Ortec PT card can be upgraded with fix from V.4.62.	11/3-2020/KARB
V.4.62	Fixed initialisation of Ortec photon timer card.	10/3-2020/KARB
V.4.61	Fixed the invalid parameter error (byte 4 - error 112)	19/2-2020/KARB
V.4.60	Option for laser pulsing has been added to single grain OSL. Option for using the Amptek Mini-X2 controller for XRF has been added to the System Options.	23/1-2020/KARB
V.4.59	The RL command can now be used with the spectrometer system. Removed EMCCD and spectrometer from the detector list in the LMOSL command.	30/10-19/KARB

V.4.58	New nNoOfPixels field added to BINX file record. It holds the number of pixels in the ROI of an EMCCD image. The field is for internal use, for now, so the BINX file format version number has not been incremented. The half-life corrected beta dose rate is now only calculated once for each sequence run instead of as previously for each measurement. A beta dose rate that changes between records in a BINX file can be confusing for calculation of recycling ratio in analysis software.	1/10-19/KARB
V.4.57	Check for jamming of beta source on/off mechanism (requires MiniSys v4.15). Sequence run statistics collected in C:\Risoe logs\RunStats.txt. SeqEd.cfg version changed from 6 to 7 as part of fixing the 'Range check error' when selecting the spectrometer detector in the 'Define and test valid combinations' dialog box. Fixed an overflow error when displaying the accumulated curves at the end of a spectrometer acquisition. In Sequence Options dialog fixed 'Save as default' for the 'Extended log' setting. In the System Options dialog the Filter changer is no longer optional with DASH.	24/9-19/KARB
V.4.56	Enabled EMCCD detector for TOL command. Requires MiniSys v4.16	24/6-19/KARB
V.4.54	For spectrometer: Horizontal Shift Speed setting fixed, horizontal flip for FVB added, run/set/pos now displayed in runtime graphs. Experimental pulsing for SG added.	5/3-19/KARB
V.4.53	Sample camera now works on Windows 10.	16/1-19/KARB
V.4.52	Added iris control for EMCCD. Show summed image at end of EMCCD acquisition. All EMCCD images now flipped correctly. Check for compatible versions of DASH driver CPLD, MiniSys, and AVR DASH software. Delete data directory if overwrite of BINX file is chosen. In Sequence Options sample names can now be block edited for ranges of positions. Refactoring of spectrometer code.	22/11-18/KARB
V.4.51	Extra acceptance criteria have been added to the new least-squares SG hole finding algorithm to minimise the rate of false positives.	21/2-18/KARB
V.4.50	Issues with sequence queueing system fixed. Dose rate error is now written to the BIN file.	10/1-18/KARB
V.4.49	• Logging and alternative algorithm added for single grain disc marker hole finding. Also removed risk for infinite loop in disc finding. • New default settings for preheat in OSL commands (OSL, LM-OSL, POSL, SG-OSL, SG-LMOSL, TR-POSL) to help less-experienced operators in making more reproducible measurements. Preheat pause has been raised to 15s and heating rate lowered to 2C/s). Also the number of channels before and after stimulation have been set to 10 to encourage checking the effectiveness of preheat. The number of channels during stimulation has been lowered from 250 to 230 to keep the channel width the same at 0.160s. • Maximum number of frames lowered to 1000 for EMCCD. • Sequences containing low-level TL commands with zero channels will not be allowed to run with old, incompatible MiniSys software (<=4.07). • Keep-alive added to SG dialogs to avoid Controller time-out.	22/11-17/KARB
V.4.48	Fixed: Since the introduction of the DASH, dead time correction has not worked for classic head and DASH without a detector changer. The max baud rate (active when Mini-Sys is selected as System Type in System Options) has been lowered from 115200 to 57600 to minimize the risk of run time error with lost connection. Execution of queued sequences is no longer halted by single grain status dialogs.	8/9-17/KARB

V.4.47	One more fix for EMCCD camera.	1/5-17/KARB
V.4.46	Fixes for EMCCD camera. PMT HV off during sample photo. Log file format restored to original. RL treated like irradiation for last dose info.	19/4-17/KARB
V.4.45	Minimized risk of RS232/USB communications time-outs on old and slow PCs. Removed option of saving in BIN V7 format. Log size extended to 5 GB (1000 rollover files of 5MB each).	7/12-16/KARB
V.4.44	Warning for possible PMT damage now shown for all non-IR light sources. CPU load from logging decreased. No Controller time-out when pausing.	26/10-16/KARB
V.4.43	Heating rate can now be set from 0.01 to 20 C/s in all commands. Memory usage lowered.	24/8-16/KARB
V.4.42	Option for 'Find disc before heating' introduced in SG OSL.	16/3-16/ TLAP,KARB
V.4.41	Serious error when acquiring Single grain data in V7 bin format was corrected. Support for spectrometer attachment was introduced. Support for new version of Timeharp 260 based Photon Timer with 0.25 ns resolution was implemented.	9/3-16/ TLAP,KARB
V.4.40	The programs can generate both V.7 and V.8 bin file formats and the EMCCD acquisition has been added for TL and OSL commands. EMCCD setup function has been added. Table editing in Detection And Stimulation Head setup and EMCCD camera setup has been improved	10/2-16/TLAP
V.4.36	A Minisys error in receiving PO commands resulted in false duplicate errors in SG acquisition. Now the PO command is re-sent to avoid this. In case of error in finding disc, an number of re-tries are done. TOL command now works for automated DASH (with Minisys Vers.>= 4.05) BIN/SEC file name is now stored in BIN file header instead of SEQ file name. Correction to input in spin boxes so you may mark all text and input number.	10/9-15/TLAP
V.4.35	An error when changing the heating rate in the TL command was corrected. Estimated end time of queued sequences was not correctly calculated. This error was corrected. Disc search for classic head sometimes asked for "safe filter combination" – this has been removed.	30/6-15/TLAP
V.4.34	License system was changed to V2	8/6-15/TLAP
V.4.33	Minor errors were corrected	13/5-15/TLAP
V.4.32	Many minor errors were corrected. Dialogs that prevented single grain runs to run from a queue have been avoided. XRF support was finalised. New Nutech USB driver was added.	17/4-15/TLAP
V.4.31	Software updated for first external release of Automated DASH. Some errors in the display of data during TL with preheat plateau acquisition was corrected.	2/2-15/TLAP
V.4.30	Now supporting automated as well as classic DASH. Pause, Resume and sequence queue functionality added. Reading of Single Grain setup from file added.	22/1-15/TLAP
V.4.29	Max temperature of 500 C on the optional irradiation heater is introduced	11/12-2014/TLAP
V.4.28	The estimated end of the sequence is reported at start and during the sequence. Preheat temperature in TL can now be defined independent of measurement temperature. Handling of transmission errors and subsequent reload of data has been improved	17/9-2014/TLAP
V.4.27	Error in handling cases where single grain discs were lost, was corrected	13/6-2014

V.4.26	Check of status registers in connection with "Bad data" error introduced. X-ray max current increase to max 2mA, but power limited to 50W	2/6-2014
V.4.25	An error concerning Photon Timer acquisition in V. 4.23 and .24 was corrected	6/12-13/TLAP
V.4.24	Violet and Green stimulation sources has been added. Sequence of stimulation sources has been re-arranged and selection of stimulation sources for pulsing has been limited to valid sources	5/9-13/TLAP
V.4.23	Sample camera setup has been changed to include manual setting of exposure time and gain. Known problem: Context sensitive Help does not work on Windows XP (problem is introduced with new compiler XE3)	13/8-13/TLAP
V.4.22	Minor change that was necessary to make Photon Timer work with final version of TimeHarp board	17/4-13/TLAP
V.4.21	Initialisation of selection tag and Integral1-4 has been added	3/4-13/TLAP
V.4.20	The data are now stored in an extended bin-file (binx) format that includes e.g. time since last irradiation, irradiation dose rate, and XRF parameters. A description is included in the updated compiled html help (.chm) and the Sequence Editor User Manual. Storage of uncorrected and background data is now possible. Irradiation dose rate may be administered and currently selected dose rate is stored with the data in the bin file headers. The sample camera attachment is supported. The program now also supports Photon Timer attachment based on the TimeHarp260 board. A mode for 9600 baud rate communication is reintroduced.	5/2-13/TLAP
V.4.12	Sample camera attachment added. Dead time correction error causing erroneous common scaling of counts, was corrected	18/9-12/TLAP
V.4.11	Serious error concerning dead time correction corrected. (V4.10. crashed with dead time correction enabled when doing single grain analysis.) Storage and display of dead time related parameters changed.	6/7-12/TLAP
V.4.10	Compiler change from Delphi 2007 to Delphi XE. Structure prepared for options introduced by autumn 2012. Check for correct regional setting. Dead-time correction implemented.	19/6-12/TLAP
V.4.06	Possibility of Illumination light source= None was removed. Illumination light source="White light" changed to " Bleaching light" and temperature control parameters with this light source was removed. Help file updated to include RL command. #SWAP_XX commands changed to allow swapping of data areas of different size. This is used in the implementation the missing TL command modes (those with temperature plateau and background subtraction)	24/2-12/TLAP
V.4.05	Minor error when connecting at 9600 baud was corrected	12/12-11/TLAP
V.4.04	Baud rate fixed to 115000 baud. Protection against blue stimulation may be set in System Options. Time since last irradiation is stored in header for each data record. Network drives may be selected as data directories in User Options.	25/11-11/TLAP
V.4.03	Errors for some special cases (angle = 0, 90, 180,-90) of finding position of single grain discs have been corrected. Also timeout limits in the finding the position of single grain discs have been corrected to make the procedure more stable. Attempts to scan outside limits are now reported as minor errors. Sequence Editor build date and Controller SW version are now reported in the log file.	5/9-11/TLAP
V.4.02	Fatal error in TL command with background subtraction has been corrected	16/5-11/TLAP

V.4.01	Errors related to POSL command (occasional division by zero, and paste errors) have been corrected	11/4-11/TLAP
V.4.00	Major reorganisation of the software. Improvements have been described in a separate Tech Note *"TN110123 Changes to V4"*. The most important changes concerns: • Grid size: increased to 100×100 • Sequence options: some options added, changed or removed • System options: Options for system gathered here and improvements made • Single Grain System-> System Setup: some parameters removed to Control Program • User options: Changes made • TL command: Improvement of usability • Setup files: reorganised so User set-up is one file, Single Grain set-up is another file	25/3-11/TLAP
V.3.39	Check for X-ray ready during start of sequence is added	3/12-2010/ TLAP
V.3.38	Error in the pulsed parameter check has been corrected. Possibility of saving SEC.file by exit has been removed	2/7-2010/ TLAP
V.3.37	The TR-POSL had a serious error that made it inactive. This has been corrected. Error in the pulsed parameter check has been corrected. Possibility of saving SEC.file by exit has been removed	17-5-2010/ TLAP
V.3.36	The User Defined command has been inactive in earlier V.3.3x – this has been corrected in the new version. Furthermore, now only commands depending on options will only be visible if the options are selected in "User Options"	12-1-2010/ TLAP
V.3.35	A buffer size in the serial communication has been increased to avoid an error in connection with POSL commands of > 1000 datapoints.	17-11-2009/ TLAP
V.3.34	A check for whether the sequence will cause timeout errors has been added. This is important for e.g. low heating rates. A new SEC file type (Sequence copy) has been introduced. The help-file is updated accordingly. The SEC files are generated automatically with the name *<bin-file name>.SEC* when running a sequence. Photon Timer data file naming has been changed to: *<bin-file name><Run><Set><Sample>.TRC*	20-10-2009/ TLAP
V.3.33	A paste error causing pasting outside what is visible in the sequence editor has been corrected A new version of the Control program (V3.33) is included: The temp read function has been improved (no mixing of the 3 temperatures, no lock-up of read function). Furthermore when "Waiting to complete command" is flashing in red, all other functions are disabled until command is completed or stopped.	31-7-09/TLAP
V.3.32	The sequence definition grid is visible during execution of the sequence. An arrow points to the currently executed operation A cut and paste error report in connection with moving lines has been corrected Use of license key for Photon Timer option has been introduced Check and warning for simultaneous use of POSL and CW-OSL boards included	8-4-09/TLAP

V.3.31	Minisys V. 3.15 included that removes the possibility of getting several empty channels in the bin file when pulsing unit is installed. A truncation that meant that acquisition time was truncated to nearest 0.5 s has been removed. Now acquisition time may be defined with a resolution of 0.01s. This version of the sequence editor supports these chages	13-3-09/TLAP
V.3.30	This version supports the POSL for controlling built-in POSL attachment. The Help files have been updated and are now again a part of the distribution. Other minor changes has been included e.g: Support for COM1-COM8, Power regulation of SG lasers now adjustable in steps of 0.1, New defaults for SG parameters. Photon Timer data acquisitions included as preliminary version only working with the particular board we use internally for development	9/9/TLAP

Control Program

Version	Description	Date/ Responsible
V.4.69	Added support for IRPL attachment (DU 4 and 5). Fixes and enhancements for Andor EMCCD camera imaging. Do no use this version for Photometrics Evolve EMCCD cameras – there are known issues.	27/11-23/KARB
V.4.68	Added DASH IRPL unit to Boot list.	2/10-23/KARB
V.4.67	New control for setting EMCCD iris position. Added DASH focus unit to Boot list.	23/3-23/KARB
V.4.64	No functionality changes, just version number increment.	8/7-20/KARB
V.4.63	See note for Sequence Editor V.4.63.	11/3-20/KARB
V.4.61	Fixed the invalid parameter error (byte 4 - error 112)	19/2-20/KARB
V.4.59	Made compatible with the new SeqEd.cfg file version introduced in Sequence Editor v4.57 and show warning when trying to modify the shared configuration file.	30/10-19/KARB
V.4.53	Disabled timer-driven status update on page 1 when DT measurement is running.	16/1-19/KARB
V.4.52	Display DASH driver board firmware version	22/11-18/KARB
V.4.51	The correct baud rate is now always displayed.	21/2-18/KARB
V.4.49	Name of executable changed from Control.exe to ControlProgram.exe to avoid clash with the Windows Control Panel which would hide the icon of the Control Program in the Windows Taskbar. The initial part of the LED calibration is now visualised in the graph.	22/11-17/KARB
V.4.48	Max baud rate changed from 115200 to 57600 to match Sequence Editor. Will no longer allow update of old PC Mini-Sys which would fail anyway.	8/9-17/KARB
V.4.47	Previous version did not work at all due to compilation error.	1/5-17/KARB
V.4.46	Minor bugs fixed.	19/4-17/KARB
V.4.42	No changes. Version just incremented to be in sync with other programs.	9/3-16/ TLAP,KARB
V.4.41	Reading of parameters 51-56 has been made dependant of Minisys software version	9/3-16/ TLAP,KARB
V.4.40	Small re-organisation of the Services tab has been done (position of DASH board unit now arranged according to their physical position)	13/11-15/TLAP
V.4.35	The control program does not ask for DASH board information if the Minisys parameter 115=0 (no DASH board installed) The USB enable check box has been removed from Setting tab to avoid accidental wrong setting that means that we cannot connect to the Minisys (if it has no USB)	5/7-15/TLAP
V.4.33	New reading and setting of calibration parameters for DASH were added	13/5-15/TLAP
V.4.32	Control of pulsed light source with DASH driver board and reading if DASH driver board info was added.	17/4-15/TLAP
V.4.31	Software updated for first external release of Automated DASH	10/2-15/TLAP
V.4.30	Now supporting automated as well as classic DASH. Automated DASH function only show up if Controller Program support automated DASH (Version >4.00)	22/1-15/TLAP
V.4.28	A minor change in the form text has been made	19/9-2014/TLAP
V.4.27	Improvement of Minisys program upload implemented. Earlier you had to respond to "finished dialog" within a time limit – this is now unnecessary	13/6-14/TLAP

V.4.25	Gating disabling ensured for dead time measurement (only relevant for systems with pulsing board). Minimum off-time mantissa corrected	6/12-13/TLAP
V.4.24	IR max power range and default setting changed	14/11-13/TLAP
V.4.23	The single grain laser power corresponding to 100% setting has been made adjustable on the "Reader settings" tab. Page Control updated modern type	13/8-13/TLAP
V.4.22	Upload of Controller software is made available from the Control program	17/4-13/TLAP
V.4.21	Last dead time acquisition data are stored in a text file (DeadTime.txt)	5/4-13/TLAP
V.4.20	Now missing old version .cfg files can be read and converted.	10/1-13/TLAP
V.4.11	Dead time estimation procedure corrected.	6/7-12/TLAP
V.4.10	Compiler change from Delphi 2007 to Delphi XE. Dead-time measurement sheet added.	19/6-12/TLAP
V.4.06	An error i the "keep-alive" feature introduced in V.4.05 affecting Pulse option calibration, has been corrected	24/2-12/TLAP
V.4.05	Minor error when connecting at 9600 baud was corrected. Control program reads status registers once every 60 seconds, which also avoids the Controller to reset automatically when idle for 5 minutes	12/12-11/TLAP
V.4.04	An error has been corrected so the use of control program does not modify SGSETUP.INI file. Connects only at 9600 and 115000 baud.	25/11-11/TLAP
V.4.00	Enabling of beta irradiation action included. Setup of single grain parameters stored in the Controller is transferred to the Control program	25/3-11/TLAP
V.3.39	Beta On introduced on the connection tab	24/8-10/TLAP
V.3.38	A tab for linarisation heater as well as blue and IR LED output has been added	2/7-2010/ TLAP
V.3.33	The temp read function has been improved (no mixing of the 3 temperatures, no lock-up of read function). Furthermore when "Waiting to complete command" is flashing in red, all other functions are disabled until command is completed or stopped.	31-7-09/TLAP
V.3.30	This version supports the POSL for controlling built-in POSL attachment. Support for COM4-COM8 has been added	9/9/TLAP

Viewer Program

Version	Description	Date/ Responsible
V.4.68	Added No of pixels in ROI field to Misc tab and Aperture field to EMCCD tab.	2/10-23/KARB
V.4.42	No changes. Version just incremented to be in sync with other programs.	16/3-16/ TLAP,KARB
V.4.41	Error correction in V.8 reading was made	9/3-16/ TLAP,KARB
V.4.40	V. 8 format that are needed for EMCCD measurements can now be read as well	10/2-16/TLAP
V.4.33	Minor errors were corrected	13/5-15/TLAP
V.4.32	Conversion of filter and deter ID to names were added	17/4-15/TLAP
V.4.31	The "select rescale" error correction was erroneously deleted form 4.30. It has been reintroduced. Some errors in the display of TL data with preheat plateau data acquisition was corrected.	10/2-15/TLAP
V.4.30	Now supporting automated as well as classic DASH files	22/1-15/TLAP
V.4.29	The "select rescale" is improved and documented in the help-file	11/12-14/TLAP

V.4.25	Now conversion of .bin files to .binx files is possible	6/12-13/TLAP
V.4.24	In error when saving .binx files to .bin-format was corrected	14/11-13/TLAP
V.4.21	In the open dialog both .bin and .binx files are shown simultaneously	10/1-13/TLAP
V.4.20	The new .binx format as well at the earlier .bin format may now be read	10/1-13/TLAP
V.4.10	Compiler change from Delphi 2007 to Delphi XE.	19/6-12/TLAP
V.4.04	Storage of user defined integration intervals is re-introduced. Maximum number of graphs in one plot is increased to 50.	25/11-11/TLAP
V.4.02	Range check error in rescaling/integration of curves has been corrected	16/5-11/TLAP
V.4.00	Expanded information on data record in data selection window (CMD(run, set, sample/grain)	25/3-11/TLAP

Photon Timer data analysis program

Version	Description	Date/ Responsible
V.1.55	Fixed an overflow error in PAT distribution.	23/1-20/KARB
V.1.54	In the Options dialog there is now a setting for processing huge files. Use this if you get 'Out of memory' error with the normal, faster setting. As a consequence of this the settings file has been renamed from PTanalyse15.cfg to PTanalyse16.cfg.	24/9-19/KARB
V.1.53	Fixed: POSL curve would bin together one more channel than selected. Max bin width power of two has been changed from 20 to 24. The setting for mode (Ortec, TimeHarp 1ns or 250 ps) has been removed. The file format is now detected by filename extension (TRC, PQ2 or PQF).	8/9-17/KARB
V.1.52	Minor enhancements in GUI.	19/4-17/KARB
V.1.51	More options in graph viewing.	24/8-16/KARB
V.1.50	Support for .PQF (250 ps TimeHarp 260 board) was made. Default number of bins and channels when plotting was introduced	9/3-16/ TLAP,KARB
V.1.48	The program has been modified to be able to read the latest bin file format	10/2-16/TLAP
V.1.47	The PATD bin file export was corrected so exported binx files may be opened with Analyst	18/5-15/TLAP
V.1.46	Now storing bin files in the V.7 format	15/2-15/TLAP
V.1.45	Now supporting automated as well as classic DASH files	22/1-15/TLAP
V.1.44	An error in export set with the Picoquant format (.pq2) was corrected. A scaling error in the stimulation time axis (x1000) was corrected	1/12-14/TLAP
V.1.43	An error that sometimes made the update of PAT distribution plot crash the program with a range error, was corrected	6/12-13/TLAP
V.1.42	rrsspp selection combobox is now reset when opening a new set	17/4-13/TLAP
V.1.41	Errors in the opening of data set ans Export to .binx files has been corrected.	3/4-13/TLAP
V.1.40	The new .binx format as well at the earlier .bin format may now be read. Outpin bin files are stored in the .binx format. The program may now also read .PQ2 files acquired with the TimeHarp 260 board	10/1-13/TLAP
V.1.21	PTanlyse.cfg is now stored in <Application data> directory (for Windows 7 compatibility)	11/4-11/TLAP

V.1.20	It is now also possible to select Photon Timer data files from a list made on the basis of the BIN file acquired in the same data acquisition that generated the Photon Timer TRC files. Export of OSL curves and Photon arrival time distribution to .BIN-files implemented. You may also export all Surface plots, POSL curves or PAT distribution curve from a data set in one operation	25/3-11/TLAP
V.1.10	Help file included. Minor error corrections and cosmetic changes are included.	12-11-2009/ TLAP
V.1.00	First external release of the program that analyses the .TRC files generated by the photon timer attachment and the Sequence editor program	20-10-2009/ TLAP

Radio-luminescence data analysis program

Version	Description	Date/ Responsible
V.1.30	More graphing options and other UI refinements.	26/10-16/KARB
V.1.20	The program has been modified to be able to read the latest bin file format	10/2-16/TLAP
V.1.10	The new .binx format as well at the earlier .bin format may now be read. Outpin bin files are stored in the .binx format.	10/1-13/TLAP
V.1.00	First official release of the program for analysing RL data. A User manual is also made available	24-2-2012/ TLAP

XRF data analysis program

Version	Description	Date/ Responsible
V.1.14	*Export Excel* can now handle more than 26 columns.	18/5-21/KARB
V.1.13	Removed two potential divide by zero errors. Aligned the ternary graph display and made windows resizable.	22/11-18/ KARB
V.1.12	Errors when reading V.8 bin file format was corrected	9/3-16/ TLAP,MYKO
V.1.11	The program has been modified to be able to read the latest bin file format	10/2-16/TLAP
V.1.10	First official release of XRFanalyse. This supports the V7 –binx format	17/4-15/ MYKO,TLAP

Viewer+ Program

Version	Description	Date/ Responsible
V.4.68	Fixed error with find markers when dot in sequence file name. Fixed error with selecting column 100 in sequence.	2/10-23/KARB
V.4.65	Made communication between Viewer+ and MATLAB Runtime more robust (requires MatlabStandaloneIP.exe v2.1 and MATLAB Runtime 9.7). Added curve spike filter menu item.	18/5-21/KARB
V.4.58	For each EMCCD ROI curve the new nNoOfPixels field in the BINX record is set to the number of pixels in the ROI pixel mask.	1/10-19/KARB

V.4.46	New MatlabStandaloneIP.exe v1.5: User can now change the parameters for image processing by editing the file C:\ProgramData\Risoe\param2Matlab.ini	24/6-19/MYKO
V.4.45	Spectrometer hotspot removal. EMCCD hotspot statistics. EMCCD hotspot removal dialog range check error fixed.	30/4-19/KARB
V.4.43	Spectrometer ROI features added. New mask ROI type for image analysis.	24/8-16/KARB
V.4.42	To decrease the size of the installer, the Matlab runtime and EMCCD example data have been factored out as separate downloads.	16/3-16/TLAP
V.4.41	Creation of circle and grid ROIs has been made more flexible and centroid coordinates of extracted ROI data are stored in the header	9/3-16/TLAP
V.4.40	The first release of a Viewer program that may also inspect images acquires with the EMCCD attachment, and do basic image processing routines to extract data for further analysis by e.g. Analyst program	10/2-16/TLAP

Minisys/Controller program

Version	Description	Date/ Responsible
V.4.22	Support for IRPL attachment.	Oct-23/LAPI
V.4.21	More support for a new green laser.	Feb-21/LAPI
V.4.20	Support for a new green laser (Flexpoint 532nm Green laser FP-D-532-10DI-C-C).	Sept-20/LAPI
V.4.19	Fixed error in DASH POSL timing with the following light sources: 'G' Green Laser in SG, 'L' Lamp, 'C' Calibration led, 'A' IR laser in SG.	27/2-20/LAPI
V.4.18	Error in POSL timing with VSL light source on CPLD version 115. Rare invalid parameter (112) issue in PO command solved. LE command added, return last error and some flags. GM return minisys free memory in bytes.	19/2-20/LAPI
V.4.17	Error in Timing for POSL with camera or spectrometer corrected, channels after stimulation there not shown. Minimum value for the aperture was not used, the value defined in parameter 129 (minimum focus position was used instead) this caused some confusion.	Oct-19/LAPI
V.4.16	Error in Parameter list minimum value of parameter 13, com output delay (time in uS between datapoints) was defined as 200μs but default value was 100μs. Command list corrected so minimum value is 100μs from minisys version 4.16. ST command: If ST 0 (set temperature) was sent to the minisys the RT 0 (Setpoint) remains at the previous setpoint. TO command with camera trigger fixed.	24/6-19/LAPI
V.4.15	Issue with calculation tolerance in SI and SF commands fixed. Minisys build no. can be read with RS 13. Detection of beta irradiator return time.	Mar 2019/LAPI
V.4.14	Fixed problems (introduced in 4.13) with classic OSL head.	16/1-19/LAPI
V.4.13	Experimental logging was introduced in V.4.12. Removed again in this version.	26/11-18/LAPI
V.4.12	DASH focusing unit supported. SI (set iris) & SF (set focus) commands added. Support for DASH CPLD version 115. Previous version of minisys does not support DASH driver board CPLD version 115.	22/11-18/LAPI
V.4.11	The SPI bus timing parameters no. 116 & 117 are now fixed values for the "old" pulsing board. 116 = 200us and 117 = 500us. For DASH the timing parameters, 116 was previously set to 10us, and parameter 117 was previously set to 100us by default. These default values was causing many retries and sometimes even SPI error 16. In version 4.11 the default values are changed: a) Parameter 116 default change from 10us to 30us. The allowed range is from 20-200us. b) Parameter 117 default change from 100us to 500us. The allowed range is from 300us to 20000us (20ms). When version 4.11 starts up it checks Parameter 116 and 117. If they are out of bounds, they will be changed to the new defaults values.	22/11-18/LAPI

V.4.10	Ext. 1 and Ext. 2 light sources were not working in the PU command. Reason: The SP arm for OSL must always be the last command executed before stimulation, otherwise it won't work. Support for "old" pulsed OSL without power regulation. Pulser version 1.09 and AVR version 1.03. Fix of error in interrupt handling. Retriggering of 300s communication timeout. The 300s watchdog timer is retriggered every 0.5s as long as an event or acquisition is active.	21/2-18/LAPI
V.4.09	DASH light source ext1 and ext2 in OS, PO & POSL etc. were missing in version 4.08. While the DASH detector (DU) or and filter (FS) commands are running the controller LCD display will show the command and its final destination.	31/5/16/LAPI
V.4.08	Changes to TL command	12/1/16/LAPI
V.4.07	Commands necessary for use of the EMCCD attachment have been added	13/11-15/LAPI
V.4.06	Support for TOL with automated DASH has been implemented	5/10-15/LAPI
V.4.03	Illumination low-level command was added	17/4-15/LAPI
V.4.02	BL command error for Aumated DASH was corrected	10/3-15/LAPI
V.4.01	For use with Automated DASH. Not yet released for Classic head	2/3-15/LAPI
V.3.37	-	2/3-15/LAPI
V.3.35	An error that made SG measurement fail after LM-OSL has been corrected. Reflection scan command (RS) has been improved to avoid unintentional stops during reflection scan. If the SG rails have run into an end stop. They are automatically removed from the end stop by Controller power-up/reset	17/9-2014/LAPI
V.3.31	A software filter on the sample temperature measurement has been introduced	June 2014/LAPI
V.3.30	Support for EMCCD camera in the following commands OS,PO,TL and TO. Problem with electrical spikes on green XY laser signal has been solved. Parameter for maximum laser power has been added.	June 2013/LAPI
V.3.29	Problem with update software UP and UW command on controllers with B-plus CPU boards is fixed. Controllers with Kontron DIMM-PC & AValue PC104 CPU modules are not affected.	February 2013/LAPI
V.3.27	An error introduced in V4.22 causing the heater relay to be on after ST 0, has been corrected.	Jan-2013/LAPI
V.3.26	This version is the first version which can be used with the B-Plus DIMMBoard, **previous versions CANNOT BE used with B-PLUS DIMMBoard as the minisys/controller program will hang if there is no graphic board present**. The only change from version 3.25 is that this version checks whether there is a graphic board present. If a graphic board is present it will be used otherwise it will not be accessed.	NOV-2012/LAPI
V.3.25	For readers with lift underneath the beta irradiator, the delay for checking the lift position was changed from 20milliseconds to 100milliseconds	June-2012/LAPI
V.3.24	Parameter 88. Beta irradiator check was default set to "0" and not as documented "1". This is changed in this version. So the Beta source check by the mechanical irradiator microswitch now is checked by default. Parameter 88 = 1.	Sep-2011/ LAPI
V.3.23	Default lift time out changed from 60second to 300 seconds Max. Xray mA default value changed from 1mA to 2mA. Active hi or lo bleach shutter signal can be changed with parameter 112.	June-2011/ LAPI

V.3.22	Changes in command ST so that ramping lower temperature is possible	May-2011/ LAPI
V.3.21	Software support for calibration of analog input channels, implemented in Eeprom. Two user commands implemented. HW reads hardware version. HT read hardware date of test, who has tested the CPU board, possible repair notes. IR set value: Value is changed so that fractional values can be written. Readback heater element: temperature RT 1 does now have linearization. A polynomial 4th order approximation is used	11-4-2011/LAPI
V.3.20	Parameter 20 – 38 and 43 – 49 are removed Parameter 43 – 49 removed Detection of XY board: if parameter 17 is set to 1 and no XY board is present the parameter 17 will be cleared automatically. BI command changes: parameter 88 determines whether hardware check of beta source activation via microswitch is enabled. If enabled an error will be reported in status register 5 if the beta source is not activated when ordered to by the BI command.	5-1-2011/LAPI
V.3.19	An error in temperature linearization was introduced from ver. 3.16 this is fixed.	13-10-2010/LAPI
V.3.18	Another error in linearization of optical power output has been corrected. Mechanical monitoring of betasource on/off implemented	24-8-10/LAPI
V.3.17	An error introduced with linarisation of optical power output has been corrected	9-7-10/LAPI
V.3.16	A error that occasionally caused empty initial channels with POSL has been corrected. Software for communication via USB has been added (only functional for Controller hardware version D or later) Parameters for linearising optical power output has been added	17-6-10/LAPI

Analyst

Version	Description	Date/ Responsible
V.4.57	A much greater range of data is now available in the summary data for each aliquot. This includes the Lx/Tx ratios for each regeneration point (up to a maximum of 15 regeneration points), along with the calculated uncertainty on that ratio. An option is now available to correct data for the deadtime of the PMT.	Nov 2018/GD

V.4.53	The main innovation in version 4.53 of Analyst is support for the use of R scripts from within Analyst. This is designed to allow users to exploit some of the sophisticated modelling functions and graphing routines available within different packages in R, especially the package "Luminescence". In addition, a number of other changes have been made, some visible, some not:	Oct 2017/GD
	a) Loading and Saving BINX files is now faster	
	b) In the summary page of the single aliquot and single grain section of Analyst, summary data are recorded for ALL aliquots that are measured. This includes those that pass criteria and those that do not. A toggle switch is available that allows users either to look at results for ALL aliquots, or just those aliquots that passed the acceptance criteria.	
	Previous version history ================= Release version 4.43 included a number of minor additions as listed below. The main purpose for the release of version 4.43 is to provide compatibility with version of the BINX file format that was introduced in December 2015, to improve support for the new DASH head and to correct a number of minor bugs.	
	The changes in version 4.43 are:	
	a) Analysis of multiple BINX files The Single aliquot Regenerative dose (SAR) page was modified to make it possible to analyse multiple BINX files at once. This means that if different aliquots of a sample were measured in two or more sequences then it is now possible to analyse BOTH files at once, so that the distribution of De values from both files can be studied. The BINX files may also have been collected on different luminescence readers. In this case the analysis should be undertaken in Gy instead of seconds, to allow for the differences in the strength of the beta sources.	
	b) Reporting precision A menu option has been created to allow users to adjust the precision with which Summary Statistics are displayed in the SAR page	
	c) Sample Camera If visible images of discs have been acquired by a sample camera attached to the reader then these will be displayed on the single aliquot page	

V.4.31.9	Analyst was made compatible with recent additions to the instrument including the DASH system, and the EMCCD. Analyst is now capable of handling BINX version 8 files that are required for the EMCCD and which are now produced by the Sequence Editor. Support for previous BINX formats is retained	Feb 16/GD
	Analyst made compatible with BINX files generated by Viewer+ based on ROI data extracted from EMCCD images	
	Several bugs in the importing of the summary files (ANR extension) produced in the SAR page have been resolved.	
V.4.31.7	New features include:	May 15/GD
	Support for calculation of fading rates (g values)	
	Ability to plot multiple TL glow curves, or OSL decay curves on a single graph	
	Component fitting of CW-OSL data with up to 3 exponentially decaying component	
	Display of .SEC files showing whether data is highlighted for analysis or not	
	Make it possible to display the radiation dose in seconds or Gray when displaying dose response curves in the SAR and multiple aliquot functions	
	Context-sensitive help system implemented, along with a full manual.	
	A range of summary statistics (mean, weighted mean, central age model etc.) are shown for the D_e values calculated on the SAR page	
V.4.14.6	Several reported errors were corrected	Dec 13/GD

V.4.12	1. In the single aliquot analysis, made it possible to fit a straight line when there is only one regeneration point (providing that 'Force growth curve through the origin' is selected).	May 13/GD
	2. Ensure that the natural point is shown on the dose response curve plot in single aliquot analysis, even if it is larger than the largest regeneration signal	
	3. Enable scroll bars on the single aliquot analysis page, fading page and multiple aliquot page if the screen resolution does not support the size of this form	
	4. Bug corrected for exponential, exponential and linear and sum of two exponential fits. These had previously fitted 1-exp(-bx) instead of 1-exp(-x/b). The second equation is now fitted.	
	5. Range check error commonly occurred when saving BINX files. This has been resolved.	
	6. Increase to 2 decimal places the parameters shown in Curve Fitting on the SAR page and the multiple aliquot equivalent dose determination page	
	7. Show zoom box using a black outline when using left hand mouse button to zoom in on a region of interest on any graph (hold mouse button down and drag from left to right). Normal display can be restored by clicking the left hand mouse button and dragging from right to left. Graph can be scrolled by holding the right hand mouse button down and dragging.	

V.4.11	• Integration limits in single aliquot calculation were not always saved correctly. Now fixed. • Dose response curve on single aliquot page did not autoscale correctly if the De was above the maximum regeneration dose. Now fixed. • Incorrect terminology used. Double exponential now renamed "Sum of 2 exponentials" • "Accept" button did not always get set correctly. This has now been fixed. • New option on main menu to allow users to "Highlight All" records • In v4.10, text in the main display went fuzzy when selected. This has now been fixed. • There was insufficient space to display the full record number on the main display if more than 10,000 records were present. This has now been fixed and this column automatically resizes to allow all digits to be displayed. • In the single aliquot display, estimate of the error on the test dose was calculated incorrectly. This has now been fixed. Additionally, the error on the test dose is now in the results column. • Select/Unselect option now able to include an unlimited number of criteria	Mar 13/GD
V.4.10	A major update from V.3.24. Major changes are: • Support for extended bin file format • Sequence View introduced • Redesignet and more flexible plotting • SAR results may now be presented in Gy if irradiation dose rate is stored by Sequence Editor • Fading rate calculation from a fading rate sequence • Asymmetric error calculation • Sum of exponential fit added	Feb 13/GD