



SparWorks Version History

SparWorks v3.4.03 (April 28, 2026)

v3.4.0003

- Correct an issue with the live export (SRO Mode), where data acquisition was stopping after the live export was completed.
- Update SRO Tuning Fork Density Control (TFD) to command more than one TFD in the string. Previously only the first addressable TFD could be controlled.
- Added additional logic to ensure USB port is open prior to sending “special commands”: CIT, SNT, and TFD.

v3.4.0002

- Updated SRO Utility for SNT. Allows sending commands to multiple SNT tools in the same string.
- Added additional USB device for HTHP (SPAR1009).
- General stability updates to Merge Utility.

v3.4.0001

- Updated the process of building memory tool programming directives: Power/Reset, Pre, and Post Acquisition Schedules. New process now supports running multiple tools of the same type in the tool string that required special commands based on the program schedules (SNT, SGR, SCBT, MFC, TFD, etc.). Previously the logic only supported one tool of each type in the string (i.e. one spectral noise tool, SNT).
- Updated session log for programming tool to include details on the Acquisition Schedules.

SparWorks v3.3.31 (February 11, 2026)

v3.3.0031

- Added the PLTester USB serial number to allowed devices for calibration of the MFC.
- Updated several forms to allow manual resizing. With the auto sizing mode based on DPI, some forms are too big for small laptop screens. Instead of changing the display settings the client prefers to shrink the form manually.
- Updated the Depth Encoder File reader to ignore an invalid depth unit, and continue processing. An error message will be showing “multiple times”, each time this condition is encountered. The system will default to “meters”.

SparWorks v3.3.30 (February 6, 2026)

v3.3.0030

- Fixed a hardware related bug that occurred during USB Enumeration. On some machines with a COM1 port, the setting in SparWorks would connect to COM1: first and prevent connection to the USB device. The workaround was to change the Port Number or disable the COM1 port in Device Manager. This update resolves this issue by prioritizing the USB connection if available.

SparWorks v3.3.29 (January 1, 2026)

v3.3.0029

- Added new SerialIOManager to handle USB Serial Devices events (arrival/removal).
- Fixed a Y2026 bug. Data from LMS was using a date range to confirm the data headers were valid in the file (legacy issue with older Real time clock chips). 2026 was considered an invalid year.
- Fixed default path for MENC*.log file when exporting MENC*.sdr file to CSV. Previously that was not set.

SparWorks v3.3.28 (October 3, 2025)

v3.3.0028

- Added a new Utility in Cased Hole Panel System GUI, to allow updating Serial Number and Tool Type of tool modules connected below the Telemetry Controller. Utility was updated to also update ADC Settings for specific boards based on the System Database.
- Updated ALL forms in the applications to better support display of the GUI's on high resolution display monitors. Previously the automatic scaling done by Windows OS required to be disabled if DPI Scaling was too high (GUI's were distorted).

v3.3.0027

- Added new method to check for valid USB devices...Testing in Progress
- Updated LAS Import to support import of multiple Array Curves. Previously this was limited to specific LAS Formatted data.

SparWorks v3.3.26 (July 12, 2025)

v3.3.0026

- Updated Cased Hole Acquisition to save and restore "depth" information. Eliminates need to reset panel to synchronize depth information.

v3.3.0025

- Updated ASCII reader to support LAS import of Spectral Noise data from third party which may not contain LAS 3.0 enhancements for Arrays (indexing, and units for 2D Curve).
- Corrected a null pointer issue with new feature introduced in 3.3.24 when outputting time-based data with no depth file. Previously, this could cause a crash if a Depth file was not included in the merge. Depth file is no longer required to export the time-based data.

SparWorks v3.3.24 (April 25, 2025)

v3.3.0024

- Updated LAS Export utility to support Scientific or exponential ASCII format for floating point numbers in the data section. For very small or very large numbers the fixed-point number format did not preserve necessary resolution for Spectral Noise Tool Data (output format passes LAS 2.0 Certification).
- Updated merge utility to output time-based data without a depth file being available. Previously this capability was not available. Merge utility would require depth data to create a log pass (whether stationary (time) or depth based).
- Added a new utility to compress the spectral density data from 2048 channels to a spectrum with lower number of channels (factors of 2). Energy is preserved with the reduction of channels.

- Add a new utility to scale the spectral density for mV pressure levels to dB re 1uPa (Log Scale).
- Added enhancements to the parsing algorithms to better handle potential download errors related to the SNT memory data (check sum errors, skipping blocks, bad headers, etc..).

SparWorks v3.3.23 (March 14, 2025)

v3.3.0023

- Updated System database and tool images to support new Enhanced Capacitance Tool, New 1 11/16" In-Line Flowmeter, and a few requested logging accessories (Sinker bars, and Quick Connect).

SparWorks v3.3.22 (January 27, 2025)

v3.3.0022

- Added a Process Log Writer when processing raw SRO data blocks from Spartek's Cased Hole Logging Panel. Details related to parsing of the data and errors that were encountered are written to a log file. Previously these were only displayed on the screen. (Only applies to recorded data).
- Updated SRO raw data file processing to handle the condition where the telemetry tool is reset multiple times while recording a Log Pass. Previously this resulted in errors computing elapsed time from the tool as it was "reset". Primarily impacted time-based recordings.
- Added feature to reset SNT Parameter's, W1-W6, back to default frequency bands.
- Updated short name in the System database for pressure and temperature to PRES and TEMP to be consistent with industry expectations.

SparWorks v3.3.21 (October 30, 2024)

- Updated Auto ACT process to eliminate the initial tool reset which forced a new tool enumeration cycle (Addressing). Ensure the tool string enumeration is based on the last power up cycle for the ACT.
- Updated CIT Parsing algorithm to confirm number of Bad Blocks in memory by checking for the flagged blocks in the table. Previously, the header information was used and it may not always be correct. Caused index out of bounds error.
- Added logic in resample algorithm in PTA view to force integer sample period (seconds), based on number of samples requested and how close the integer sample was to the requested number of samples.

SparWorks v3.3.20 (September 22, 2024)

v3.3.0020

- Updated ASCII export (txt, csv, and EXCEL) to allow custom formatting for the Date Time. Previously this was fixed to ISO 8601 format. Default is the international standard user can uncheck the box to use the custom setting.
- Added a Slip Over Centralizer to tool diagram library. Image drawing application was updated to automatically create a transparent background for slip over tools (new feature).
- Added the Hybrid Start Delay time to the Log Report when processing memory data.
- Added logic to force the correct sample rate for the SNT tool. Previously the value being sent when reading the tool parameters may be inconsistent with actual ADC sample rate (this issue was created with a new default that the tool will record data on power on).

- Updated processing and unit for SNT Spectral Density from dB to mV (Pressure unit). Requires the Spectral Density Curve calibration to be updated to mV units.

SparWorks v3.3.19 (August 16, 2024)

v3.3.0019

- Added back pre-table directive to control the PL Tool Bus Power, when running the Hybrid SRO/Memory Controller.
- Added Logic to manually add SNT Stationary Data Windows

v3.3.0018

- Updated processing algorithms for Array PLT: i) Added additional delay for the flow data related to buffering (n-3), ii) Updated the resistivity computation based on signal to noise limits of measurement for both high and low resistivity values, and updated default filtering for flow sensors.
- Updated the calibration file import utility to allow override of database default method of calibration for a given sensor (i.e. Polynomial Fit vs. 2D Polynomial with temperature correction).
- Added a new feature to override the line length limit for LAS2.0. This allows unlimited length output with no wrap. Files created with this override will not pass LAS Certification.
- Added logic to allow user control of reprocessing of PL Tester data, and prevent duplicate reprocessing. This can now happen without the PL Tester being connected.
- Updated Sensor Diagnostic Screen to show Record Time (Elapsed Time). Also updated interface to be consistent with Cased Hole Logging Panel.

SparWorks v3.3.17 (May 17, 2024)

- Added a new feature to the Sensor Diagnostics to allow recording of the data with the PL Tester. Data is sampled in time and can be plotted or exports after recording. All data is preserved in the PLTT*.sdr file format.
- Update depth merge of Stationary data for SNT to allow manually changing the size (start and end) of each stationary stop.
- Updated the new EXCEL export utility to take advantage of outputting 1 million rows of data. Previously the limit was based on the version of Excel that was installed on the machine. The new EXCEL export utility no longer requires Excel to be installed for creating Excel files.
- Updated the text orientation in PTAView. Error was related to the port from Java.
- Updated the SNT Diagnostic Form, Start Address was converted to a 64 bit address from a 32 bit address. This allows testing of all of the SNT Memory (> 2GBytes).
- Added new capability for Depth Merge of Stationary SNT Data. Utility has capability of using both median and average filters.

SparWorks v3.3.15 (November 15, 2023)

- Updated the Date Time format for EXCEL and ASCII Reports to ISO 8601 format, "yyyy-MM-dd HH:mm:ss". Fixed ambiguity related to current regional settings and Date Time format being used on reports.

- Updated the DataInput stream used for reading and parsing recorded data from LMS (Depth Encoder) to remove the Mark and Reset function that were not supported in C#. This issue can cause a parsing error depending on the value of the last recorded sample before the next recorded file.

SparWorks v3.3.14 (August 25, 2023)

- Updated a bug in the Memory Depth Encoder interface. The UI would not let you select a Log Presentation from the form (missing record error).
- Corrected index out of bounds error when creating an ACT with the Hybrid Memory Controller with 14 or more addressable sensors. Limitation related to legacy tools were removed.
- Added new UI/control features for the Tuning Fork Density (SS8502). With updated tool and this version of SparWorks or higher, the user can turn the tuning fork on/off. This is used primarily for operations with the Spectral Noise Tool. Control has been added for both memory and SRO operations.
- Automatically updated the LOCAL (regional information) for US.en when importing an LAS File. Corrected import issue if regional settings decimal point is a “,”.

v3.3.0012

- Corrected Series number for Tool Type 62 in the System Database to SS8315SA (1.0” OD Pressure Module). The legacy series number, SS8335SA was assigned to the 1.375” OD Compact Production Logging Tool. This created a potential issue when building the ACT.
- Added Series Number to the tool name for the UI when working with the Acquisition Control Table.
- Updated the User Curve Import utility to look at both Short Name and Curve Name when mapping data on import.
- Updated default amplitude gate width for the 1 11/16” SCBT to reflect higher frequency of the transducer. Gate width was reduced to prevent seeing the second cycle.
- Updated Sensor Diagnostic Tool to allow editing the default ACT to view non-default curves.
- Added new Log-Log Derivative Plot for PTA View (Default filter Length is .1).

SparWorks v3.3.11 (May 12, 2023)

- Corrected error handling for WellObjects (tubing, packers, nipple, etc..) in LogEdit. Now able to properly save and edit WellObjects in the latest version of SparWorks (v3.3.11 or higher).
- Reverted default filter for the Spinner curves back to standard 11-point binomial filter.
- Updated LAS Reader to handle Warrior LAS import with missing curve description. Previously would cause a read error.
- Updated System database to replace SS8490SA with SS8490SB (SNT) with the correct tool Make Up Length.
- Added additional error checks and serial port checking logic for the Depth Encoder User Interface. Previously if the user would unplug and plug the USB while in the window, depending on what action was selected they may cause the program to hang (USB device is not recognized). Normally, SS6800 would be connected to the PC prior to opening the Depth Encoder Window and the communication would be initialized correctly.

SparWorks v3.3.10 (March 28, 2023)

- Removed Excel Interop DLL and replaced with OpenXML SDK. This update improves the performance of the export to Excel, and removes dependency on 32 bit Excel Application being install on the machine. Creation of Excel file is not dependent on the Excel being installed on the machine (other than to view the file).

SparWorks v3.3.9 (March 3, 2023)

- Updated the process for programming the SS8122 SB Hybrid SRO/Memory Controller. This resolves a potential issue of failing to properly initialize the SCBT in memory mode.

SparWorks v3.3.8 (March 2, 2023)

- Updated/Corrected the series number in the System database for the In-Line Flowmeter to SS8442 SB.
- Added a new feature for “Live Log Pass Export” during SRO recording. New feature will allow creating of ASCII of selected data without impacting the current data recording.
- Corrected a displayed number shown in the pipe section display in Log Edit to reflect the joint number (vs. Class).

SparWorks v3.3.7 (February 14, 2023)

- Added new feature to allow updating curve filters in the merge view, and SRO (SDR to Database process). Maximum Filter Length for Average filter is increased to 4095. In addition, a customized low pass filter has been added to help with removing the effects of stick slip or yo-yo on the spinners.
- Updated default filter for the Spinner curves to a heavier average filter.
- Added a new Utility in SparWorks to help with processing Calibration data from the MFC tools.
- Added exception handler for DLLNotFoundException (SHCore.dll). This was causing program execution to stop on some older version of Windows (without DPI Awareness).
- Updated Calibration Output files to show correct min and max range of the data used in Calibration. This was missing for the temperature corrected data.

SparWorks v3.3.6 (December 23, 2022)

- Updated reprocessing of Spectral Noise tool data: Corrected potential issue of a file locking, add ability to parse MSNT data that may have multiple runs with large blank gaps in memory.
- Added new Dual Roller Centralizers and MFC 40 with extended fingers into the Database and added support into SparWorks. Corrected series number for the HTHP Fluid ID in the database.
- Updated LAS Writer to include the Array Curve value and unit in the “description field” of the Curve Section. Format is consistent with LAS 3.0 Document for handling Array data (`CHAN[1].Unit : Description {AF10.4;0ms}`).
- Update Curve Import Utility to support LAS import of Array data (specifically data, exported by SparWorks).

- Removed automatic default UnitType selection on curve import for several unit types to prevent automatic unit conversions other than for standard basic measurements (depth, pressure, temperature, speed, etc..). User can still manually choose UnitType. (Prevents mV from bond curve to being converted to Volts).

SparWorks v3.3.5 (October 29, 2022)

- Corrected System.xdb database migration issue. Fields Coef31-Coef39 in table Calibration were not being migrated on “updating system database”. This migration issue has been always been in the code (never reported). This would have impacted tools which have large number of coefficients (MFC, Pressure Sensors) during migration. Those calibration coefficients would be zero (corrupted) when the database was migrated. (critical).
- Fixed a reported glitch in the Log Pass (SDR to Database), under some conditions when logging up the curves would not be processed. This occurred if you started logging down before logging up. This is fixed and variation in log direction will not impact the LogPass creation. (critical).
- Updated the Communication Port Icon in the MFC Calibration GUI. Image was not ported correctly on this form (minor).

SparWorks v3.3.4 (October 27, 2022)

- User reported LAS Export with “no data” (sometimes), also Log Edit would not always plot the data without reopening the Log Pass a second time. Issue was a file “share” permission, as the file was already open in a different thread and being reopened. This conflict is now being handled in the code.

SparWorks v3.3.3 (October 6, 2022)

- Removed reserved CurveID, 10056 for internal temperature from obsolete Rev A Memory Controller. This was creating an issue with creating and ACT with other tools that used the same CurveID.
- Fixed Log Pass (SDR to Database) issue with missing points when converting an SDR file to a LogPass in the database. Issue was dependent on ‘Depth Sampling’, so it was not identified during early testing.
- Fixed ACTItemForm, surface sensor information was not being properly displayed or updated.
- If the ACT was modified during the auto act process, it was not reloaded before sending to the tool. This has been corrected.

SparWorks v3.3.2 (October 3, 2022)

- Fixed Date Time formatting in Encoder and Cased Hole Logging UI's
- Updated installation so that SparWorks/SparDepth can be installed in any directory. Synchronized release of both packages.

SparWorks v3.3.1 (September 28, 2022)

- Fixed issue with Null object when opening Encoder window from the Memory Production Logging GUI.
- Added new feature to Sensor Module Diagnostics: Open / Close bus switch.

SparWorks v3.3.0 (September 14, 2022)

- Added back 1:200 vertical scaling option (Log Plots) (inadvertently removed when updating Vertical Scaling to manage both time and depth options).
- Correct object null error when open Log Merge View (first time curves are created).
- Updated the About Information to remove prior information related to Java libraries.
- Updated documentation included in the release.

SparWorks v3.2.0026 (August 12, 2022 Internal C# .Net 4.8)

- Completed removal/replacement of the J# runtime libraries. Framework is now .Net 4.8.
- Corrected issue with Editing ColorMap Threshold. If no value is entered, a null value error would occur.
- Updated amplitude processing algorithm for SCBT. Previously determination of peek required 3 points. This would fail and return zero for 5 foot VDL (low sampling and frequency of 1 11/16 tool).
- Updated SDR to Database processing to properly handle both Time based (stationary or moving) and variable log direction passes (Depth Based). Updated LogView to support time-based plotting (automatically switches the vertical axis (depth or time) based on Logging Mode. Depth Simulator is no longer used for time-based logging/recording.

SparWorks v3.2.0024 (June 12, 2022, Internal C#)

- Updated the Color Map Utility to allow users to customize colors and thresholds. This requires an update to the Project Database.
- Updated project database to store user color maps. Default color maps are defined in the database.
- Fixed the display units for 2D curves on Log Edit presentations.
- Migrated the language resources to ResX formatted file (XML). Updated all related utility for Language maintenance to C#.
- General cleanup for forms, and code related to C# porting effort.

SparWorks v3.2.0021 (March 16, 2022, Internal C#)

V3.2.0021

- Correct time shift in the PTAView (Shift Primary Data). Time porting issue.
- Updated Internal tools (Fir Filter Design, CommProcess).

v3.2.0020

- Corrected issue related to copying files from “other” location to the project folder.
- Fixed issue related to opening the “Windows Explorer” and showing the Calibration Folder.

- Fixed issue related to plotting curves; new metafile format would stop plotting additional items if the plotted curve was outside some limited bounds. This could occur based on curve wrapping or invalid scale settings.
- Cleaned up additional forms, and fixed potential null object errors related to “String Function” ToUpper. This impacted several areas of the code related to SerialNumbers.

v3.2.0018

- Added back capability to process memory data from the RevA memory Controller (this was removed previously in 2019).
- New installation include DPI Awareness set to per monitor.

v3.2.0017

- Fixed writing of metafile to save the Tool Program Report (previous had a file extension issue and was saving as a png file).
- Fixed Filter string issue for the OpenFileDialog.
- Ongoing, GUI clean-up for C# version WinForms.

v3.2.0016

- Corrected LogPass Path used in the PrintJob manager, previously if the project database was changed in the LogEditor, this Path was not being updated.
- Ongoing, GUI clean-up for C# version WinForms.

v3.2.0015

- CIT Analysis Updates: Fixed a bug in deleting pits; Rolled back to the previous version of pit length estimation; Removed the offset in baseline calculation; Implemented the option to use the new ML model (Machine Learning) when the calibration is available.
- Disabled the Hybrid Power Control directive during the Pre-Directive.
- Updated the log information for the Encoder to show the Sensor Configuration that was programmed in the LMS. Added dongle serial number to main SparWorks Control GUI.
- Replaced MSCOMM32 OCX, and all WFC Graphics related to drawing and printing with their .NET Equivalents. Updated Windows Metafile format and Serialization (SER) used for saving log elements (not readable by older versions of SparWorks).

SparWorks v3.2.0014 (October 18, 2021)

v3.2.0013

- Updated MSCOMM driver to correct an issue where the COM port was being closed inadvertently. This only impacted COM Ports (serial communications) not USB communications.
- Added new directives to allow Hybrid Controller, to delay power on at startup, as well as go to low power mode based on the program tables. Program Report was updated to show this delay.
- CIT Analysis: Updated the penetration estimation part to use ML model based on casing calibration serial number. (ML is a new AI method for interpretation).

- Updated Tool String Diagram to include tool descriptions with the tool diagram. Added ACT Name to the Tool Diagram Title.
- Updated System database for 350°C temperature specification for the newer HTHP tools
- General stability improvements (Null Pointer checks).

v3.2.0012

- Modified system database for MAPLT Tool: Converted Calibrations Units for Resistivity Measurement, Added new WHI curve for the Cap Sensor. Algorithms for MAPLT computation in SparWorks were also updated based on this update. Updated calibration method for Resistivity to temperature corrected.

v3.2.0011

- When switching the Time Unit (seconds, minutes... etc.) in Merge View, the x-axis data for one of the two curves may be incorrect, if the two curves have different sample rates. This results in the data being plotted incorrectly, and has the potential to cause an index out of bounds error.

SparWorks v3.2.0010 (June 9, 2021)

v3.2.0010

- Corrected a bug in image log plotting. Previously depending on image width resolution, the depth scaling of the image would not plot correctly.
- Some improvements to CIT Analysis (determination of length and width of defects).

SparWorks v3.2.0009 (May 19, 2021)

v3.2.0009

- Added addition error checking to CIT Tool Calibration GUI, to disable Pad Serial Number button if the ACT does not include a CIT Tool String.

v3.2.0008

- Added new feature to CIT Tool Calibration GUI, modify/add Pad Calibration Files associated with a tool. Pad Calibration files can now be updated to include the discriminator calibrations.
- Updated SparWorks and System database to provide support for the RevC version for the CIT Memory Controller.

SparWorks v3.2.0005 (February 22, 2021)

v3.2.0005

- Modified Curve label/legend for log plot. Unit and scales are now displayed below the line type.
- Corrected a few minor bugs in CIT Analysis Module: creating filename when exporting pit report with joint start index larger than 1, anchoring the labels and combo boxes for joint start index and pressure method list, and baseline curve unit in CIT module.

SparWorks v3.2.0004 (February 2, 2021)

v3.2.0004

- Implemented multiple pressure failure methods. With a dropdown list, users can choose among three different methods: ModB31G, B31G, and Barlow. When exporting the pipe report to an ascii file, the method name will be auto included in the suggested filename.

- Implemented a feature that when a joint is deleted, its pits will be added to the previous joints. This allows the user to setup temporary collar to divide the joints into different sections and merge after processing each section separately.
- Auto setup suggested MFL threshold when a casing calibration is loaded.
- Add the ability of exporting all pit info simultaneously to one file.

v3.2.0003

- Added additional error checking when importing a calibration file. Previously an invalid filename leads to a bad record in System database. The system did not parse the serial number correctly.

SparWorks v3.2.0002 (January 13 2021)

v3.2.0002

- Updated memory tool programming GUI to allow for a single program step time to be greater than 99.99 hours. Actual recording time limit is still determined by battery power, samples acquired, and memory size. This change eliminates the need to create a new program step to exceed the limit on hours setting.
- Updated the date parsing algorithm throughout the code to ensure a two-digit year is always interpreted between 1970 and 2069. After 2020, it appears the .NET parsing would roll the two-digit year to 1921.

v3.2.0001

- CIT:
 - The unit of pit width is changed from percentage to actual dimension (mm or inch)
 - The corrosion type of pit is changed to dim class based on the industrial definition
 - A general corrosion check box is added to casing calibration selection form. When the box is checked, the calibration will be converted for general corrosion.
 - Grouping threshold for length and width are added to the module to allow user input.
- MFC:
 - The unit of pit width is changed from percentage to actual dimension (mm or inch)
 - An error in displaying pit peak value is fixed.

SparWorks v3.2.0000 (November 1 2020)

- Initial release of the .NET version of SparWorks. Code base is the same as the previous 3.1.0020 release. Recommend previous versions of SparWorks are uninstalled before installing this version.
- Added support to work around a potential tool programming issue (Client Request), where the tool information and program stored in the tool memory (meta data), does not match the actual tool program table being executed by the same tool. The software will now allow a tool program from the database (assuming it matches the actual tool program) to be used for tool string (tool type and serial numbers). (Rare, first time this has been reported).

SparWorks v3.1.0020 (October 9 2020)

v3.1.0019

- Updated Project Database migration to be capable of migrating database with size if 1 GigaByte. Previously an out of memory error would be thrown.
- Added support for a new Aluminum based EC Discriminator Calibrator. Modified MFL800 calibration algorithm to support the standard EC, Eddy Current discriminators.

- Updated system database to support Tension tool A/D coefficients, as well as, the correct measure points and tool diagram.
- Additional updates to improve stability of the .NET version of SparWorks.

V3.1.0017

- Stopped Calibration Sampling Window from “reopening” when clicking “Calculate” or “Save” immediately after sampling data.
- Minor updates to MainPLT GUI to prevent user activating functions that are not allowed when doing playback or record, and correct potential null pointer error.
- Update CIT Analysis to synchronize updates to Collar Picks.
- Several updates related to .NET Porting (printing, reading and writing files from default directory).

SparWorks v3.1.0016 (September 8, 2020)

V3.1.0016

- **Updated System database to include new HTHP GR and HTHP Memory Controller Sapphire PTS (images, offsets, etc). Updated project database to support future .NET release.**
- Updated Graphing and Reporting Utility for Gauge data (PTAView) to support high time resolution burst data from the fast sample gauge.
- CIT Analysis Module – Added "Export ASCII" function to pit report. User can now export pit report for each casing joint.
- Added new channel, Tool Bus Voltage, for the Hybrid SRO/Memory Controller.
- Updated the Calibration process for the Spectral Noise Tool.
- Corrected an identified issue with creating a tool program with new Cable Head Tension tool. Issue can occur if a non-controller tool has an associated curve with same curveID as one of the controllers.
- Added initial support for Hybrid Controller.

SparWorks v3.1.0015 (June 28, 2020)

V3.1.0015

- Updated System database to include OpenField FAST tool. Added basic processing for data blob.
- Added burst calculation to CIT Pipe Report.
- Updated PL Tester interface to support Skeleton Command for opening relays. Corrected a potential race condition depending on tool string.

v3.1.0014

- Modified SRO SNT Control to Stop all acquisition when talking to the SNT Tool. Allows for stationary recording of WAV files.
- Updated SNT memory parsing, to reset elapsed time to zero based on initial data recorded.
- Updated RDR export to use the updated processing methods as our current Memory Controller. Previously this function was obsoleted (last support was SparWorks v2.00 or earlier). Not confirmed/verified by client.

v3.1.0013

- Added SNT Graph View to Sensor Module Diagnostics.
- Added logic to Cased Hole Logging Panel to check USB status. Auto ACT now resets tool string to ensure for both CIT and MFC, a “Joint Start Index” editor is added so that the joint can start from any positive integer of user’s choice. By default, it starts from 1.
- For MFC, the link between the curve view and polar view is established, so that user can double click on a depth in curve view to switch to the polar view at the depth of interest, and vice versa.
- SNT Updates: 1) Added support for new Channel 0, 1, 2 (waveforms) for SRO/Memory Controller Operations and SNT (Change in data format). 2) Added support for new Record Mode and outputting of WAV audio files, 3) Added additional diagnostic utilities. 4) Removed Set Trace Sample Rate (now command driven for log mode).

v3.1.0012

- Added ability to create ACT for Hybrid Controller (requires update to System.xdb).
- Corrected “Localization” issue on the Log Header GUI. (number format).

SparWorks v3.1.0012 (February 10, 2020)

v3.1.0011

- Added logic to Cased Hole Logging Panel to check USB status. Auto ACT now resets tool string to ensure the latest configuration is recognized.
- Updated image plotting to include interpolation for lower resolution images.
- Added additional clean up and functionality for the Spectral Noise Tool.

v3.1.0010

- Added processing support for data recorded in Spectral Noise Tool. Basic wellsite deliverables are now available. Added support for new channels 0, 1, 2, 3 for SNT SRO/Memory modes.
- Added support for operations with Memory Controller for start and stop record features for both CIT and SNT.
- Added support for start and stop record for SS8130SC CIT Memory Controller in Cased Hole Logging System and Memory Controller. Added this controller to the CIT Diagnostic Interface.

SparWorks v3.1.0009 (December 28 2019)

v3.1.0009

- Updated Table View in the three main calibration GUI’s to ensure last data entered is read prior to computing the calibration (click calculate). Previously, a calibration may have been updated without the “last” data value entered.

SparWorks v3.1.0008 (December 23 2019)

v3.1.0008

- Modified the System database: i) Changed descriptions for E-Line Centralizers type 130 and 133, ii) Added support for ADC updates capability in SparWorks (two new tables, removed PLTester Legacy tables), iii) Added basic tool info related to the new Hybrid SRO/Memory Controller.

- Added error checking/message when a user attempts to create a memory tool program without a valid memory controller in the tool string. Previously this would throw an index out of bounds error.
- Updated the interface for the Generic n-order Polynomial Calibration Interface: i) Supports more data points (previously limited to 16), ii) supports scientific number formats, and iii) added link to Windows Calculator App.

v3.1.0007

- Corrected an error in the ACT auto build for the CIT Memory data. Updates for the SNT, created a conflict in the ACT for the memory-based CIT data. All non-default CIT curves were removed. This was introduced in v3.1.0004 (only impacts CIT Tool).

v3.1.0006 (beta)

- Modified the drawing order for the table header in tool diagram to prevent some versions of ADOBE PDF writer from causing a white background (vs. transparent) on the text string to overwrite the grid outline (bottom grid line).
- Updated back color of the Project Text Fields to light gray to show that they are read-only. Removed the currently unsupported Time Vertical Index from the log presentation control.
- Modified the SRO Logging Speed computation to use the Elapsed time generated from the SRO panel. This limits updates to 1 sample/second max. Previously this used the elapsed time from the tool (10 samples/second). Communication errors created artifacts on the speed curve.

SparWorks v3.1.0005 (October 31, 2019)

v3.1.0005

- Added additional logic to the Auto ACT function to ensure the Flowmeter curve to added when a centralizer is attached in between the electronics and flowmeter. Issue would only have shown up in v3.1.0004 (special early release for immediate client issue).

SparWorks v3.1.0004 (October 29, 2019)

v3.1.0003

- Added support for SS6800 LMS USB interface for sampling data with the calibration utility (auxiliary channels). Previously this only worked for the RS232 serial interface. Updated status messages for commands to the SDHC Card for this device.
- Corrected an issue with the computation of “calibrated” values from the Aux Channels (Surface Measurements) from the Cased Hole Panel. Error was introduced in November 2016 (v3.0.0015). Calibrated values were not being computed (i.e. not changing).
- Removed entries in the System database related to tool adapters for HTHP Centralizers and HTHP Bullnoses. Previously the ACT Tool Configuration Control would prevent adding these tool accessories unless the specified adapter was in the string.
- Corrected a bug related to reprocessing SRO data files to raw data vs. computed data. Previously the raw data depth and speed were left as “internal units”. This created a depth error when the external depth units were set to feet.
- Added logic to Copy Files utility to skip subdirectories. Previous if a file had the same name as a directory this would throw an exception. Utility is used when importing files from other directories.

v3.1.0002

- Added logic for Auto ACT in SRO mode to gracefully handle the error condition of a tool in the tool strings responding with an invalid tool type. Previously this would create a null pointer error and force the user to restart the process.
- Added initial code to parse SNT memory data (work in progress).
- Added logic to handle corrupted time stamps received by the CIT memory controller from surface computer. This can result in large elapsed time values which can impact the ability to merge CIT data.

SparWorks v3.1.0001 (July 31, 2019)

v3.1.0001

- Updated libraries as part of .Net porting strategy. Primary change relates to namespace and interface differences.
- Modified default spectral gamma ray sample rate to 2 samples/second while other sensors are left at the maximum rate possible.
- Added additional error checking logic when programming memory tool to ensure the sample rates are aligned on time slot boundaries. That is the ratio of any sample rate (largest/smallest) is always an integer or whole number.
- Corrected a rounding issue related to the change in the default number of samples acquired (minor bug in v3.0.0045).
- Added additional logic to deal with potential errors related to handling of elapsed time from the tool data. Previously this could create large anomalous speed computations.
- Updated Spectral Noise tool commands and data format.

SparWorks v3.0.0045 (June 22, 2019)

v3.0.0045

- Fixed the error checking routine in memory tool programming which prevented 16 sensors from being acquired at 10 samples/sec. Corrected similar issue with the default sample rate computation (double precision rounding error).
- Changed the default sample rate for Spectral Gamma Ray to 2 samples/sec.
- Updated default sample time to nearest second (previously rounded to hour). Limit is based on memory available.
- Added initial support for the Spectral Nose Tool.

SparWorks v3.0.0044 (April 17, 2019)

v3.0.0044

- Added color coding to the CIT and MFC Pipe Report.
- Added error handling related to index out of bounds when exporting data from SparWorks. If the depth level for output exceeded the starting depth of the curves (no data available), an index out of bounds error occurred. Code was updated to properly handle this exception.

SparWorks v3.0.0043 (April 1, 2019)

v3.0.0043

- Updated System database and images to include the new SS8580SC HTHP - Fluid ID, and SS8608SA Fluid Density Radioactive.

SparWorks v3.0.0043 (March 12, 2019)

v3.0.0043

- Corrected index out of bound error relating to ACT Tool Configuration with greater than 16 tools in the string.
- Update Capacitance Processing algorithm to create two curves: Frequency and Water Holdup Indicator, WHI. The frequency data is the uncalibrated filtered raw capacitance data. The WHI is a linearized hold-up indicator that is calibrated between 0 and 1. All current and historic capacitance tools have been updated to provide this interpreted result. This puts back in place the previous quick look interpreted curve.
- Improved the resolution of the text strings presented in Cal General Form (Polynomial Fit) to Double Precision. This includes updating the data written to the exported Cal File.

SparWorks v3.0.0042 (March 10, 2019)

v3.0.0042

- Updated ASCII Export utility to revert back to using the regional settings to determine the output format for the exported ASCII files. In the prior release we fixed the output format to ISO standard, however this created some issues with external clients.
- Added a new feature to the Sensor Module Diagnostic to allow setting of the Memory Controller Tool Type and Serial Number.
- Added new Capacitance Tools and Fluid Density Radiation to the System database. Corrected depth offsets in database for the SS8080SC HTHP - Quartz PT CCL GR - Spinner Elect. - 1.688D (GR, CCL).

SparWorks v3.0.0041 (December 9, 2018)

v3.0.0041

- Updated Export ASCII for the Memory Depth Encoder utility to correct for GUI resize issue, as well as extend functionality to allow selection of curves and curve order for output (released in SparDepth 19 Nov 2018). Corrected the Date Time unit String to be consistent with new output format string.
- Updated ASCII import utility to fix a parsing error of LMS ASCII data files (error was introduced in version v3.0.0035). Added additional support to better handle fixed column spacing and space delimited files. Added support for additional Date/Time formats (currently 26 different Date Time formats are supported).
- Corrected potential bug when Auto Adding Curves to presentation (index out of bounds error).

SparWorks v3.0.0040 (October 25, 2018)

v3.0.0040

- Updated ACT Tool Configuration Filter to include “bullnose” under “Accessory and Special”.
- Updated CIT Calibration GUI: a) Added Additional details to the Log File to identify Pad and Sensor, b) Refreshed current tab page on Get Data, c) Added DSC calibration for RevB Type DSC Calibration (R Axis Coil MFL used on MFL800 currently).

SparWorks v3.0.0039 (October 12, 2018)

v3.0.0039

- Updated support for the 1 11/16" SCBT to allow for centralizer between electronics and mandrel. General update to the system to support tools with same serial number together that are not addressable. Previously tools would automatically be combined if they shared a serial number (tools with multiple boards/tool types are handled in this way).
- Updated default offset value for the MFL800 to 28. This value will be used for future work related to tool normalization process.
- Updates to CIT/MFC Analysis; Pit Info Tab, 3D Graph Name, added radial exaggeration to 3D View.
- Corrected a minor bug in Curve Average, Min, and Max routines related to depth level spacing.
- General Update to default Date Format to ISO Standard to be consistent with various regions.

v3.0.0038

- Added support in System database to store and manage MFC Calibration Fixtures (bowls). Added GUI's in MFC Calibration/Verification Utility to support Select/Edit/Add/Delete/Clone.
- Updated Cal File Reader/Writer to support reading and storing Span and Zero values for 2D Polynomial Calibrations (previously these were always defaulted to 1 and 0). Updated all 2D polynomial GUI's, and methods to support "Span and Zero". Required for Field Calibration of MFC.
- Update MFC Calibration/Verification Utility to support Field Calibration and updating Cal File. Requires PLTester interface for these functions.
- Added HTHP Helper commands to support testing and calibration of new HTHP Memory PTS (Baud Rate, Model, Acquire One Sample).

v3.0.0037

- Updated CIT Diagnostic Utility to support new Pad Types for MFL375, MFL450, and MFL575. Updated CIT Calibration Utility to skip DSC Calibrations for newer pads.

v3.0.0036

- Updated MFC Verification Report to support new calibration method: Added serial number of Calibration Bowl, display up to 12 diameters (previously limited to 6, able view all temperature calibration steps, simplified process of saving report for plotting, added different report titles (pre, post, etc.).
- Updated LogEdit to correctly handle the importing of image files already located in the default directory. Previously you had to select Cancel or the file would be deleted.
- Updated ACT Tool Configuration Check to correct for issues related to the old HTHP Sensor electronics, the Flow Curve or fluid Density Curves did not show up automatically when the external sensor is present.

SparWorks v3.0.0035 (April 13, 2018)

v3.0.0035

- Updated SCBT Utility to automatically update the tool type (number of receivers) when reading raw data file. Previously it would default to a tool with 8 radial receivers. The Curve calibration status is now updated in the SCBT Utility after running a calibration in this view.
- Updated System database to correct processing method for the 3 axis Accelerometer data from HTHP Gen II tools. Updated RB/Dev Calculation to support the HTHP Accelerometers.

- Correct unit conversion issue in MFC Analysis. Added new Form in CIT Analysis to display pits for each pipe joint. Allows the pit parameters to be edited.
- Updated System database for tool type 155, upgraded HTHP Sensor section to GenII configuration.
- Added a new Utility for testing the SRO Controller. The utility allows for updating the serial number and tool type from SparWorks. This will be primarily used by Manufacturing and Repairs.
- Added the ability to select and delete multiple ACT Items. Deleting an ACT Item will delete all curves associated that Items.
- Updated ASCII Reader/Import utility to provide support for reading in ASEP/NOV Depth files. General cleanup to improve handling of Date Time information.

SparWorks v3.0.0034 (January 27, 2018)

v3.0.0034

- Updated the progress bar in CIT Analysis routine to work for > 100 pipe joints.
- Corrected the default calibration algorithm in the System database for calibration of the new HTHP GR's and Spectral GR measurements.
- Updated processing algorithm for MFC Caliper to 2D Temperature Compensated Polynomial.
- Updated depth offset computation for CIT and HTHP to handle "external tools" consistently. This corrects a new error in the Tool Diagram for the CIT introduced in the December release. Did not impact recorded depth offsets only the tool diagram.
- Updated the ACT Tool Configuration GUI, to remove error checking when manually building a tool string (Add, Shift, Remove, etc.). The tool string is now checked on save. This improves user experience when manually building or adding to the tool String.
- Updated ACT Tool Configuration GUI to include a Tool Selection Filter to aid the user in finding and selecting tools.

SparWorks v3.0.0033 (December 27, 2017)

v3.0.0033

- Correct index out of bounds error when shifting the last tool using the Edit Tool Configuration. Error was introduced in last release (December 12, 2017).
- Updated merge view to properly refresh plots when changing the program steps.

SparWorks v3.0.0032 (December 12, 2017)

v3.0.0032

- Modified SGR Gain-Temperature compensation table to include limits for min and max gain based on allowable gain range. Also added additional error checking for the inversion routine.
- Updated SCBT Graph view to include additional error checking logic (null pointer) and to support the six-segmented receiver of 1 11/16 SCBT Tool.
- Add a correction to the SRO Depth display (recording was correct) to correct the speed displayed (bug was introduced in unreleased version 3.0.0027). The speed was be 2x if panel tool power was off (no tool data).

- Added option to view the RD curve in the cross-section plot for MFC analysis.
- Fix the bug when cloning a presentation due to the length of the presentation's name being too long.

v3.0.0030

- Added additional error checking during AutoACT to prevent null pointer error (related to missing name in log presentation curves).
- Added error checking for processing 2D Calibrations. Possible null pointer error while Calibration is being saved/loaded while Data is being acquired in SRO mode.
- Corrected Pad Tool Type on CIT Pad Calibration Display (previously was showing pad serial number).
- Updated RB Computation for CIT memory RB board.

v3.0.0029

- Removed the concept of external tools from SparWorks. All tools are now just part of the tool string. All variations are now handled by Code and/or System Database. New architecture allows for multiple tool communication adaptors (required for HTHP Gen II).

v3.0.0028

- Updated CIT/MFC processing algorithms.
- Updated SRO Processing to allow Depth, Time, and Logging Speed to be created/saved when no tool string is connected to the panel (i.e. tool power is turned off). Previously system was using elapsed time from the tool data packet.
- Updated Database to correct for sensor board address of the new 1 11/16 KTK Centralizer.

v3.0.0027

- Added diagnostic commands for the HTHP family of controllers (Start Record, Stop Record, Start SRO, Stop SRO. Updated programing for HTHP Controller to include the Operating Mode Parameter.
- Updated Font Color for Filter in GUI for editing ACTItemCurve (Filter Setting).
- Updated the ACT Manager to display all curves for a given ACT (vs. only ACTItems). Allows the user to view filter settings and offsets. Modified the edit interface to select the specific curve when editing the ACTItem. This impacts ACTItems which has multiple associated curves.
- Updated System database to support accelerometer data blobs for the HTHP Controllers (required for calibration. Updated SparWorks to handle processing this new data type (processID – 27).
- Updated the Serial baud rate for Rev B and higher Memory Controllers from 115,200 to 230,400. This only impacts Serial Interfaces like new HTHP String. Should not impact older memory controllers which relies on USB interface.

v3.0.0026

- Add the following Tools: Tension/Compression, HTHP GenII Controllers (5) to System database.
- Updated Tool String Diagram to handle Slip Over devices. To add a Slip Over device, it should be position in the tool string after the tool it will Slip Over (it has to be drawn first). The device must also be added to the database with image.
- Added logic to test USB port prior to attempting to communicate with the tool string (eliminates a series of unnecessary error messages).

- Updated System Database to support multiple tool adapters for same tools (primarily HTHP Flowmeters, centralizers, etc.). Identify controllers from the database (vs. hardcoded in code). This includes providing support for the new HTHP Controllers for memory operation.

SparWorks v3.0.0025 (June 6, 2017)

v3.0.0025

- Updated SGR PHA Spectrum curve to correct issue with data export.
- Correct SGR Calibrated Curves to include three new curves.
- Updated default Isotope Processing Order to be consistent with spectral stripping algorithm

v3.0.0024

- Updated memory processing to handle “empty” program step. Previously this would create an error when reading the file.
- Update CIT Processing to include pipe failure parameters.
- Removed the SCBT 3.5” 8 Receiver tool (tool type 403) from the database.
- Updated SGR programming to include PHA gain temperature compensation.
- Updated commands for SGR Gain compensation (temperature stabilization).
- Added SGR control interface and initialization. This is used to control the settings of the tool in memory mode.
- Added SGR processing parameters interface, and processing algorithms.
- Added SGR Spectrum display for both memory and diagnostic mode.
- Modified MFC Radius Calibration tool to flush the first four samples. Previously, due to buffering in the tool and acquisition system, it was possible to have one or more samples from the previous ring size to be included in the current ring size average. The system average 50 samples, so this error was not always apparent.
- Updated the System database to include the new HTHP Sensor electronics, HTHP Fluid ID, and HTHP Gamma Ray tool.
- Updated System database to include Images for Tool Diagram Viewer for new 1 11/16” centralizers, Spectral GR, and CCL.

SparWorks v3.0.0022 (February 14, 2017)

v3.0.0022

- Updated RB Calculation to account for chip orientation relative to Pad 1 of the Array PLT tool.

v3.0.0021

- Reset the threshold for “Streaming Data” with the PLTester to 150 bytes. This allows older versions of the PLTester to work with the MFC tool.
- Added error checking when reading LMS GPS EPROM Area (been removed from new models of LMS). This can cause an illegal negative array dimension exception error.

v3.0.0020

- Corrected a potential issue when importing ASCII depth file in log merge. If the Elapsed Time and Date Time Curves are not in synchronization errors occur in Merge Utility when switching between Date Time and Elapsed time units. The import now forces them to be identical in the Merge View.
- Added new features to Merge Utility: Show Points, Copy, Print, and Save Graph. These features are on the context menu for each graph.
- The output depth based data from Merge Utility “depth step” or “increment” is now automatically adjusted to maximize depth resolution for high resolution sampling. This value is updated after setting Pass Start or Pass Stop. This value can be overwritten.
- Corrected bug in Merge Utility where the curves did not “refresh” when changing program steps.
- Added Error Message Output to the Log File when processing MFC, SCBT, SGR, and Array PLT Data blocks (shows checksum errors, etc.). This information is also shown in the Sensor Diagnostic Window.
- Updated SparWorks and PLTester hardware/firmware to support reading large data block tool data (>255 bytes, SCBT, SGR, MFC). A new streaming command was designed to allow large data block transmission and improved acquisition speed with PLTester.

v3.0.0019

- Modified the data block size for MFC to include checksum (all sizes). Added algorithm to SparWorks to disregard MFC data with bad checksum. Change to database and SparWorks prevents reading older data sets (prior to Dec 1, 2016).
- Added initial data collection and processing support for the Spectral Gamma Ray.
- Updated PLTester interface to support streaming of large data blocks. Will require updated PLTester Firmware (version xxxx).
- Update MFC Block size and data handling to support checksum.

SparWorks v3.0.0018 (November 17, 2016)

v3.0.0018

- Updated processing method for both Memory and SRO logging to support RB computation from X and Y accelerometer data (CIT).
- Added method to import BenchMark’s E-Line Hoistman Panel Log File as an ASCII Time Depth file for merging with memory log data.
- Updated the method to calibrate the Inclinator Data from the MFC and the data processing to compute Deviation and RB.
- Added MFC CalLow, and CalHigh calibration method to the MFC Radius Calibration Window. Supports automatically collecting and storing data at the same time the fingers are calibrated at room temperature.
- Updated MFC Processing to include Pit and Collar Identification.

v3.0.0017

- Corrected a reported issue when merging non-memory PLT data. After the merge the loaded data is corrupted. The workaround was to reload the data (this occurs if there more than one pass is created).

- Added method to override tools read during programming of the memory controller. This allows the controller to be programmed independent from the tool string connected (caution should be used to ensure the ACT actually matches the planned tool string being run).
- Corrected the OD of the 2 7/8" continuous flowmeter (previously was 2.825 in the database).
- Updated MFC calibration utility to correct for some issues identified with reading and processing data (ACT).
- Updated MFC Utility (general bug fixes and improvements).

SparWorks v3.0.0016 (September 6, 2016)

v3.0.0016

- Corrected issue when loading a 2D Calibration file from file. When more than one tool of the same Tool Type is in the ACT, the secondary curve index was not being updated correctly.
- Added PL Tester interface to the General Calibration "Sample Window".
- Added the MFC Calibration / Verification Utility to SparWorks. Included data gathering, calibration of all "fingers", and creating of verification report.
- Added Tension to the Depth View display for the Memory Depth Encoder.
- Corrected PLT Array Tool temperature compensated X and Y accelerometer to be read as a signed 24-bit integer.
- Load / Reload ACT after selecting or modifying Memory Tool Program. Previously the ACT and Curves were not updated on the Main Memory Logging System Form after editing ACT in a tool Program.
- Corrected a "potential error" of Selected index error (out of bounds) on the Data Export Utility.

v3.0.0015 (August 20, 2016)

v3.0.0015

- Updated the System database to mark auxiliary channels on the LMS as sensors that require calibration. This omission was introduced in the v3.0.0004 release July 23 2015 when the new field was added.
- Changed reference to MMC Card to SD Card. The SD Memory Card Software has been updated for LMS box.
- Updated query used to read curve presentations, ensure the order is consistent. Previously when multiple curves with same name were plotted the indexing was not consistent, and the order the curves were plotted would change.
- Added control and processing for the second generation BHGM tool module.
- Added curve processing for the Array PLT.
- Updated User manual as part of the release to current version.

SparWorks v3.0.0014 (July 12, 2016)

v3.0.0014

- Corrected error in curve index used in Tool Diagram. Error was introduced in previous version (3.0.0010). The curve measure points were not correctly plotted.

- Updated the query used to copy curve presentation details. With Win7 and higher the ADO drivers were updated, this created a potential error when copying curve presentation line types and colors.
- Updated System Database to support new BHGM, Centralizers, new 1 11/16 P/T tool, and Multi-Sensor Array PLT. Added updated tool diagrams for MFC's, new Density, Centralizers, and Multi-Sensor Array PLT.
- Added basic Multi-Sensor Array PLT processing (diagnostics and memory).
- Added HTHP Memory Controller to definitions for Memory controllers.

v3.0.0013

- Updated Depth Encoder Erase Timeout back to 120 seconds.
- Added logic to set SCBT parameters (downloaded to the tool) in Auto Program. Previously this was not setup properly for SCBT.

v3.0.0011

- Updated Depth Encoder Interface to support the new High Speed USB version of the LMS Box (LMS_HS).
- Removed GUI support for the GPS in the Depth Encoder Interface (feature was obsoleted in LMS boxes many years ago).
- CIT Analysis: Corrected plotting of Pipe Joints when units were set to English. Added new parameter "Collar Margin Length" to exclude picking peaks associated with a collar. Corrected links between pipe report and pipe section graphical plots, Added/moved button/menu to launch CIT Analysis to LogEdit. Corrected a bug in using the bench collar for normalization (related to curves with different level spacing), corrected depth shift error on processed curves.
- MFC Analysis: Added new utility to process and analyze MFC Data (identifying pipe joints, correcting for eccentering, polar plots, and more).
- Added support for Relative Bearing Correction for RB Curve in Curve Image.

SparWorks v3.0.0010 (January 4, 2016)

v3.0.0010

- Corrected a curve indexing issue in the MFC and SCBT Calibration Status Form. Curves are filtered in these utilities which lead to the index error.
- Updated computation for the MFC tools to include Relative Bearing, Deviation, XPOT, and YPOT. The XPOT and YPOT provide for a mechanical RB measurement.
- Updated the MFC processing to include temperature correction, and computation of calibrated RDMAX, RDMIN, RDAVG.
- Converted calibration units for the MFC to millimeters ("mm"). This will be consistent with the provided calibration jigs.
- Updated error handling when exporting LAS file to prevent the following condition: If Country is set to "Canada", and UWI is invalid, the system would throw a null pointer error.
- Updated LAS Writer: 1) Modified the Date field to only include Date (removed time), 2) Added Format Specification for Date {DD/MM/YYYY}, 3) Added depth reference information (GL, KB), 4) Updated the LAS Depth mnemonic to DEPT (From DEP).

- Added logic to handle Calibration for external sensors. Corrected an issue with the Fluid ID section for the HTHP tool. The correction also will handle other external sensors (CAM, HTHP, etc.)

v3.0.0009

- Updated the SystemDb migration utility to correct an error when migrating System.xdb version 8 or earlier (2012 or earlier).
- Corrected an issue with enumerating a tool string with PL Tool Tester interface box. Previously if the Tool Type was set to 0xffffffff or 0x00000000, the Sensor Diagnostic Utility would not recognize this as invalid.
- Corrected the following behaviors associated with Log Header Editor: 1) If multiple Log Headers are associated with a Log Run and the user selected a Log Header in the interface, it would not actually select the Log Header unless some other change was made to the Log Header. 2) When adding a Log Header to Print Job, if the user changes the selected Log Header, the Print Job would be updated with the originally selected Log Header (not the changed selection).
- Updated the Casing Calibration import utility to allow selection of one or more Casing Calibration files.

SparWorks v3.0.0008 (November 5, 2015)

- Added 3D viewer to the system. Viewer is primarily used for CIT Analysis Module.
- Depth Label orientation has been rotated 90 degrees. This creates additional real estate for well object or other tracks.
- Added a new Calibration Manager to MainView. The utility allows the user to import/export calibration files without the need to create a matching Acquisition Control Table (ACT). There was a general cleanup of the export / import of Calibration completed as part of this process.
- Moved the setting of the Track Position for WellObject to “Edit Well Object” interface. Changed default to be the depth track. Corrected parsing of negative numbers.
- Removed the software switch in the CIT Memory processing to not use the PAD Time Stamps. This was a temporary fix to recover data from a logging job that had invalid Time Stamps.
- Corrected the WellObject Editor to allow negative depth values. Previously it would consider these as invalid values.
- Updated CalFile to support Casing Calibrations. Updated format for the key string, improved parsing methodology for support of new tools.
- Removed Cal Aux tables, originally planned for CIT calibration, but have been replaced with new architecture. Pad Serial numbers have been moved to Calibration table (from Aux tables).
- Added Pipe report, used for summarizing analysis for MFC and CIT type tools. Updated Log Header to support casing grade and joint type. GUI's have been linked to the new CasingMaster table and Pipe Report.
- Added support for the PLTester to the Sensor Diagnostics (directly communicates with tool sensor modules, no memory or SRO panel required).
- Corrected an issue with saving Well Objects and/or Log Annotations. Previously, if the users open the Log Edit view with “no” Well Objects or Log Annotations, then loads a file “with” Well Objects or Log Annotations, the system will not allow you to Save any changes made.
- Added additional Color Maps for Pipe Joint Classification (5 Class) and high contrast (8 Color).

- Added to the Tool String Diagram Viewer to main menu of the Memory Logging System. Allows the user to view the currently loaded Tool String (per ACT).
- Added raw data channels for RB Sensor to System.mdb. Allows lab to collect raw data that is not temperature compensated.
- Removed the error checking for a valid depth when adding a Log Annotation. If the depth was < 0 (negative), this was throwing an error. Depth can be negative in some cases.
- Added 2D Curve Image creation to the CIT Analysis tool. This image will be used for identifying and quantifying damage and corrosion.

SparWorks v3.0.0006 (Release September 16, 2015)

v3.0.0006

- CIT Analysis Updates: Added 3D View, Improved collar picking, added Normalized MFL curves, improved the user interface.
- Updated the algorithm in LogEdit for Image plotting (2D Map); Increase plotting speed and reduce memory requirements for the image (previously it was possible to create an image that was too large to be plotted by the system [depth resolution too high]).
- Increased the number decimal places for Start Time and End Time in the merge data view.
- Corrected a depth offset error with the CIT Memory Curves. Previously reported but not verified or corrected.
- Streamlined the ACT creation for ACT Memory Curves (eliminated/consolidated some steps to speed the process). A new CIT Memory ACT is always created. Previously this was “updated”.

v3.0.0005

- Corrected Null Pointer error in Curve Edit Utility. If no curves are present in the Log Pass a Null Pointer error would occur.
- Updated LogPass name field length from 50 characters to 80 characters. Updated error checking to verify this field length is not exceeded.
- Updated Import Data GUI to allow LogPass Name to be updated by the user. Previously this was set to the file name of imported data.
- Updated System.xdb database to include additional units of length (inch), and magnetic field (Tesla).
- Update Yellow to Brown and Brown to Yellow color map to include 5 colors.
- CIT Analysis is being restructured to generate logging report. Source and destination log pass.

SparWorks v3.0.0004 (Release July 23, 2015)

- If the System.xdb file is missing, the software will automatically create a new System.xdb database, previously the software would exit.
- Added a switch in the CIT Memory processing to not use the PAD Time Stamps. If the user selects NO, the system will assume the acquisition is based on 200 samples per second. If a header time stamp is not written between record off and record on, this could result in some lost time (require re-syncing). This is a temporary feature to work around a firmware issue related to turning the tool power off in the middle of a recording session, the time stamp value is corrupted and does not recover.

- Updated the ASCII Output in the Merge Utility to output CSV (Comma Separated Format) ASCII Text File. This outputs the data currently being viewed.
- Added the ability to select multiple items to delete presentation curves.
- Updated Curve Names for CIT to MFLnnn, DSCnn, and TMPnn. The sensor numbering is in the correct order circumferentially around the tool.
- Updated the default File name when exporting LAS Files to support naming convention of AER. This feature is only active if the Country in Well Information is Canada.
- The API Code for Measured Depth was added to the LAS export.
- Updated Project Database to support both surface and bottomhole UWI (AER Requirement). Well Class has been updated for proper support of the UWI LDS Location Information. This information is also shown on the Log Header.
- Updated the Log Presentation GUI to control the color of the horizontal grid lines. Previously these were defaulted but the system and could not be changed.
- Updated the Logo Maker to ensure the created Logo is properly centered based on the height to width ratio. Previously the logo was only centered in one direction.
- Added the ability to copy the Log Presentations from Old format Project database to the new format Project database. The system will now update the Project database prior to copying the files, previously the operation would fail.
- Added new Time Slot algorithm to deal with newly supported tools. This information is used to optimize the auto program sample rate. Previously this defaulted to 10 samples per second.
- Re-arranged the GUI interface for CIT Calibrations. Added additional warning messages and information to the session log to notify the user if the tool parameters were not read properly (i.e. the tool did not finish initialization process when the parameters were read).
- Updated the default plotting capabilities of various plot objects. All basic plot objects are designed to be 8.25 inches wide, with a paper width requirement of 8.28 inches (Log Header, Banner, Tool Diagram, and Calibration Report). The printed object will be this size if the paper allows it, or will automatically shrink to fit the print area of the paper. The Log Plot size is based on the track layout. If the paper size is too small, the user will have an option to shrink to fit, otherwise the plot will be cropped by the print area of the printer.
- Modified the LogHeader to be the same resolution as the other plot objects, 600 DPI (previously this was at screen resolution). LogHeader Preview was updated to reflect this change.
- Modified the Print Preview tool so the plot area is 8.5 inches. Corrected the View button so that the correct plot type was passed to the viewer (would not always scale the plot correctly).
- Added Calibration Report to the Print Job Utility. The calibration report is based on the selected ACT, and those curves that have calibration records in the database.
- Added a new feature to Merge Utility. You can now view curve values from both the Log and Depth plots. Values are displayed above the main plot area. A check box is used to turn this feature on or off.
- Updated Printer Utility to properly handle Printrex 920 color printer (200 DPI by 300 DPI). The asymmetric print resolution was causing the print to not scale (render) properly.
- Corrected an error in interpreting the Tool String stored in Memory Controller. If non-addressable tools are located above the memory controller, the system would incorrectly assume the format stored in memory was

an old format. This caused the actual tool string to be interpreted as “External Tools” (tools located below a tool bus adapter).

- Corrected an index out of bounds error that may occur in memory operations. If you remove the ACCEL and/or Battery Voltage Curve from the ACT Table, and use this ACT in memory tool program, the default Program Items will throw an index out of bounds error. The workaround and what is normally done is to uncheck the AcqFlag in the Program Items table.
- Updated the revision numbering to reflect build number as well as the code release number.
- Updated DataExport Utility to support the export of Array Data (i.e. Waveform data).
- When changing database in various utilities, the Default directory for CRVFiles was not always being updated correctly. Previously this would have only impacted CIT Data, but with this updated version, all MPLT and CIT Curves are now stored externally to improve the efficiency of the systems in handling larger files.
- Updated the memory processing to support computation of all curve values; raw and calibrated, from the raw data file. This eliminated the need to reprocess the full dataset when merging passes.
- Updated System.xdb to provide full support for 24, 32, 40, and 60 arm MFC. Programming was updated to provide memory control of the motoring functions, open, close, and stop.
- Corrected the Check Tool Configuration function when opening the ACT Review from the Main Memory Production Logging Window (File -> Open ACT Manager). Previously the command would time out when opening the ACT Manager from this path (did not load communication drivers for the memory tool).
- Updated the Memory Master Processing method to support SCBT and MFC as blob datasets. Curve merge has been updated to support these types of datasets. Part of this change was to save all processed time based data to separate CRV files. Now all memory data is stored as raw data curves prior to curve merge, these curves can be reprocessed without re-computation. This also reduces the memory required by SparWorks.
- Updated the project database to store named parameters. New master project database is SparPLT.mdb (renamed). Added a new utility to update older version of the database. Order of the database update was modified to reflect: 1) Checking System.xdb first, 2) Checking the Project.sdb on open.
- Updated ACTToolCfg manager to maintain correct tool order for the CIT Tool with RB Sensor. Required exception logic due to the tool order in the database.
- Corrected Null Pointer when trying to add an ACTItem for a tool that has no valid Sensor Curves (i.e. Centralizer). Updated database to ensure tools with no Sensor Curves in the database would not create a default item (issue with CIT MFL Sensor settings, when creating a default ACT).
- Updated table Units in System database: added new time units (μ s, ms), corrected the conversion factor for transit time (not currently used).
- Added “Attenuation” as a unit to the Unit Control GUI (dB/m, dB/ft).
- Added a new table, Casing Master in the System database. Will be used to automate the SCBT setup process.
- Updated the module that recovers tool program from the raw data file to properly handle the condition when disabling the acquire flag in the tool program. Previously this would create a mismatch between the number of items in the program table versus the actual tool acquisition program. This flag is not used in with the newest memory controller, so the recreation from the programming steps is “different”. This was left in the

programming table for backward compatibility. Warning messages were updated to clarify which check was failed during the process of recreating the tool program from the raw data.

- Removed the old hard coded logic to correct for driver issues for the Printrex printers. Previously if a printer reported a printer resolution of (203x, 203y) this was converted to (203x, 200y). This is now handled correctly by the printer driver.
- Added a new flag associated with Sensor Curve. The flag is used to mark curves that may require calibration (versus curves that do not require calibration). Update various GUI and support function to use this information.
- Added a new flag associated with Sensor Curve. The flag is used to determine which curves will show up on the tool diagram (measure points).
- Calibration File Format (*.CAL) has been updated to support multiple Curves per Sensor. A new field MapID has been added to the keys to identify these curves. Default MapID is zero, and is not written for backward compatibility.
- Renamed the Flow Meter default curves in the database to reflect the type of Spinner: Fullbore, InLine, and Continuous.
- Updated Export Cal File to ensure backward compatibility with prior versions of SparWorks. The MapID is a new field that is not supported in earlier versions of SparWorks.
- Updated Curve merge utility to use check box's to select curves. Modified GUI to allow user to expand the list view window.
- Added new feature in the Calibration Review window to automatically select the default calibration method based on the curve type.
- Significant Enhancement of the Log Plotting Capabilities:
 - Ability to plot image data.
 - Modify Track Layout (Log / Linear Grids) Number of tracks etc..
 - Curves presentations are now tied to the track. Previously they were independent. This allows curves to be moved more efficiently.

SparWorks v2.0.8 (Release July 29, 2014)

- Added a new well object, "Side Pocket" Mandrel or Gas Lift Mandrel in Log Edit.
- Updated a query used to create ACT Curves to include third party tool series and tool name when using communication adapter. This was handled differently in the previous database design, prior to release 2.0.0 of SparWorks.
- Updated the SCBT Utility to allow viewing of waveforms from the SCBT memory file.

SparWorks v2.0.7 (Release July 21, 2014)

- Modified the memory parsing routine to accept up to a 10 minute gap (600 seconds) in the acquired data. Previously this was set for 1 minute (60 seconds). This allows the software to pass over a section of memory that was invalid, and correctly parse the rest of the file.
- Updated the Memory Log file to output the time stamps detected when the memory block length changes.

- Corrected a processing error related to a special calibration AlgorithmID associated with a third party tool. This created a null pointer error when exporting RDR file.
- Corrected a header parsing error introduced in v2.0.6. The software would incorrectly skip or not provide accurate information for headers that contained no data (only impacted the log file).

SparWorks v2.0.6 (July 2, 2014)

- Updated a query in the Tool Diagnostic Form based on the new database design. The query was failing with the new database structure.
- Added logic to support the 3.5 inch SCBT with 12 receivers. This required a modification to the table parameters that control the SCBT tool.
- Update the SCBT memory programming to correct the number to TSlots required for the SCBT Data sets. Ensure tools running below the SCBT will function properly.
- Added logic to support the new SS8121SA Memory Controller 1.699D. Requires an updated database.

SparWorks v2.0.4 (May 30, 2014)

- Corrected a new error in the merge utility when reading in ASCII or other non ACT created data, a null pointer error would occur when creating the curves in the database.
- Updated defaults and handling for the decimate factor for the SCBT (sample period).
- Added additional support for the SCBT to write and read the tool parameters that control timing for the SCBT. This information is also preserved in the Memory Controller, and data read from the tool.
- Updated the Excel Export function to include Excel 2013. Previously an error would be displayed saying Excel was not installed.

SparWorks v2.0.2 (Release May 12, 2014)

- Updated LAS Import Utility to support additional Date Time formats when reading the Well Information Section.
- Updated LAS Import Utility to parse Curve Name from the Description Field (added “,” as a token, and removed numeric value from the beginning and/or end of the field. Updated for 3rd Party LAS Import.
- Updated Unit Type mapping algorithm when importing units. Previously the algorithm ignored Case. This created a conflict between units g and G (as one example).
- Updated the Import Utility to update the Log Pass Date/Time. Previously this was the time the Log Pass was created. It will now use information from the imported file if available.
- Updated the Create Log Pass from SDR (and Reprocess SDR) method, to allow the Depth and Speed curves to be preserved when “Export All” is selected. This outputs all data collected based on Time index (versus Depth Index).

SparWorks v2.0.1 (Release May 7, 2014)

- Updated the dongle security check to allow existing licensed dongles to work with the latest version of SparWorks v2.0 or higher.

SparWorks v2.0.0 (Release May 5, 2014)

- Version 2.0 and higher requires System.xdb version 9.0 or higher.
- Added a log file when processing a memory based depth encoder file. The log file provides details on the actual depth calibration data, and other header details.
- Updated the MSComm32.ocx error handling logic. On some machines without COM ports or with a COM port that are all disabled, the object can be set to null by the operating system. This can cause the system to hang or throw a null pointer exception error depending on when it occurs. Error is dependent on the version of MSComm32.ocx that is part of the Operating Systems.
- Updated SRO panel control menu to add a pass through command to perform a soft reset on the telemetry controller..
- Added logic to display the Dongle ID in the status bar of the Dongle Update Utility. This is only visible if the Dongle is plugged into the computer.
- Corrected a System database migration issue. Previously, the ToolID for the surface sensor was not properly updated. Issue has always been there (never reported).
- Corrected a potential Null Pointer Exception Error during ACT Auto Build. If the tool returns an invalid tool type as part of the string, this could cause an unhandled exception. Exception is now handled.
- Corrected the Job Report so the Tool Serial Number prints correctly on the report (previously it did not print).
- Updated the System Database to support the process of decoding multiple curves from single sensor “blobs”. This is a significant structural change to the architecture of the system. This change allows us to process multiple curves from tools that require this (including multi-dimensional curves). It also allows us to create an interface to allow third party vendors to provide their processing algorithms. In addition to impacting the System Database, this also impacts all code associated with Acquisition Control Tables, Tool Diagrams, and Data Processing. It does not impact existing tool protocol (communication to tools, programming tools, and/or tool command protocols).

SparWorks v1.67 (Release October 28, 2013)

- Corrected a potential null pointer error when opening the Encoder Window. Error was associated with an interrupt being called before a time value was initialized. This could occur if there was an error in loading the ACT and associated calibrations.
- Trapped a potential null pointer error that will occur when opening the Merge View without having any curves selected to merge with the Depth Encoder Data. This potential error was introduced into the system as part of the CIT tool integration.
- Appended the serial input buffer “byte count” to the time out error message when communicating to the SRO Cased Hole Logging Panel or LMS Box. This will provide information if the timeout was related to no command response received or if windows was not able to read the serial input buffer before the time out occurred. Also increase the length of the timeout from 300 ms to 1000 ms.

SparWorks v1.66 (Release September 12, 2013)

- Added module to the CIT Analysis for picking and saving pipe joints (Collars).
- Correct an error with the Depth From used in WellObjects (No reported issues).

- Added new methods to save the current graph zoom setting to the Graphic module. Used to support the latest zoom features in the Graph Library (Feature is used in CIT Analysis).
- Create a new WellObject to support pipe section, Log Well Pipe Section. This database object will be used to store pipe section analysis summaries on a per joint basis.
- Corrected an bug introduced in v1.65. When in SRO mode, and acquisition is enabled, you may get a null pointer error when opening the calibration window.
- Added waterfall plot and 2D image plot to the CIT Analysis view.

SparWorks v1.65 (Release August 23, 2013)

- Modified the System database to support a positive only flow channel for the HTHP Flowmeters, and a Reed Switch Status indicator.
- Updated the ACT Item Form to support fully tools that have external sensors (HTHP Sensor Section), and various client specific communication adapters (CAM's). Previously the sensors were associated with the adapter. They are now associated with the external tool. This allows for the correct computation of measure points.

SparWorks v1.64 (Release August 22, 2013)

- Corrected an issue decoding/reading a short LMS data file. If the LMS memory file recorded was limited to "one data block", the file downloaded would not be read by SparWorks. Work around is to record a longer data set. This issue did not occur in version of 1.41 or earlier as the error condition was ignored.
- Updated the Installer to automatically change the access rights for System.xdb. Setting the access rights to the folder and files eliminates the need for the user to run with administrative privileges.
- Updated Tool List View in the SRO Window to include external tools (primarily for HTHP PLT Tool). This is now consistent with the memory tool list view.
- Update System.xdb to include new HTHP Production Logging tools, HTHP Centralizers, Cable Head Tension, Knuckle Joint, all current Spinners, bow spring options for full bore spinners and centralizers, and other various accessories (25+ new entries). Images for the tool sketch was updated to include all of the above equipment.
- Updated the System Diagram Viewer in SRO Logging Window to link to the new Tool Diagram Viewer.
- Updated the Tool Diagram view to properly account for tool offsets and measure points for "External Sensors" i.e. tools below the Communication Adaptor, and below the HTHP Sensor Electronics.
- Corrected an issue associated with deleting the Calibrations from Calibration Status window. If you imported the calibrations files again (without exiting the window), it would not load. This was associated with the curve still maintaining the previously loaded calibration. This is now updated on delete.
- Updated the "Import Calibrations" in the Calibration status form to also update the secondary index for curves that use the 2D Polynomial Calibration function.
- Added code in the System.xdb update utility to update the secondary index (ToolID) for the 2D Polynomial Calibrations. If this ID changed as part of the database migration the Secondary Index for the calibration would be missing.

- Updated the default MFL Offset value in the CIT Calibration Form based on the MFL section type (Zero Offset Jig).
- Updated LogEdit to be able to plot both CRVFile Curves as well as Project Data base curves. Required to support plotting of CIT Data which is handled differently due to the large file size.
- Added support to allow the user to enter the “measure point offset”. Previously the tool depth must be “zeroed” at the bottom of the tool string. The offset allows the depth reading to be set at any location along the tool string. This offset will normally be “negative” representing a point above the bottom of the tool string. By default this value is set to Zero (0).
- Updated the ASCII reader to support the ASCII File Export (TXT File) file from the NanGall Depth Encoder. The user should export a Text file with the following format option: “dd/MM/yy HH:mm:ss.s”. The fixed column format reader was updated to default to “right justified” unless, the first column data value is numeric and left justified. Previously if the first column was Time and fixed width and/or “left justified”, this forced the default for all values to be “left justified”.

SparWorks v1.61 (CIT Release April 1, 2013)

- Updated Data Export to handle CIT data export (no file size limitations). Other data is still read from the database as before.
- Developed buffered reader for CRV File format. Allows access to data by levels or blocks. Eliminates the need to read all data from the disk file.
- Modified Merge Utility so it does not overwrite the previously saved Start Time when processing CIT Data. Also now will recompute the start time whenever the raw data is reprocessed. CIT Data has a provision to tag the memory data in real time.

SparWorks v1.60 (CIT Release February 25 2013)

- Added a check box and button in the Merge View to either auto refresh the plots, or manually refresh plots. This becomes important with large data sets (update speed)
- Modified the CIT Calibration window to include offset adjustment for the MFL sensors.
- Update Data Export to not load the data till ready to export. Previously all data was loaded when opening a log pass. This is an intermediate step for handling large data files.
- Integrated new ADO wrappers to support the latest version of msado15.dll. Previous library appears to not be supported in Windows 8. New wrappers are compatible with Window XP – Windows 8.

SparWorks v1.53 (Beta Release Only)

- Updated system database to include the new 1 11//16 inch SS8111 SRO Telemetry Module and SS8211 Gamma Ray/CLL module.
- Updated support for the BHGM (Tool Sketch, Measure points).
- In the Merge Data form, the filter list associated with Log File Name was updated to show MCIT*.sdr files as part of the view all log file types (default filter). Previously you had to explicit select MCIT files for file type.
- Changed the default setting for the Source Control to Dynamic Source “Enabled” to true (“Checked”).
- Changed the default sample interval for the depth encoder (LMS) from 0.1 second to 1.0 second.

- Added “Magnetic Field” as a unit to the Unit Control GUI. Default unit is Gauss (G).
- Added to Casing Calibration Utility for use with the CIT Tool. Utility is used to manage various types of casing responses to be applied to the CIT Magnetic Field Strength data. Includes Utility to view, edit, and create Casing Calibrations.
- CIT Analysis routine will take Casing Calibration data and apply it to CIT Magnetic Field Data. Used to convert data from Gauss (Magnetic Field Strength) to wall thickness.
- Added new Utility to read EM CIT Calibration data, and merge it with our Calibration Fixture data. Utility computes all curve fits, as well as collects calibration data for the discriminators. Tool is primarily used to improve the efficiency of calibrating up to 160 CIT sensors.

SparWorks v1.52 (September 30, 2012)

- Add new table was added to Systems.xdb database to support auxiliary calibration information for the CIT (Casing ID, OD, and Description). Updated associated queries to support new information. The field “Description” will also be used to support descriptive comments associated with a calibration (i.e pad serial number).
- Corrected a bug introduced in version v1.5.1. Merge utility did not load log curves under some circumstances.
- Corrected an index out of bounds error if the secondary curve index was not available for the 2D polynomial calibration method.

SparWorks v1.51 (September 17, 2012)

- Modified the Vertical Scaling Parameter in the Log Editor to allow the user to type in any value or select a value from the list. The value is a floating point number. The update was added to allow a user scale a log to perfectly fit a single page (A4, Letter, etc.).
- Added utility to export a Warrior (SDS) compatible calibration file for the Acoustic Density (“Temperature Corrected”), Pressure Calibration file (“2D Polynomial”, .cff), and Temperature Calibration File (“Polynomial”, .cft). This minimizes the need to manually create a Warrior compatible file from SparWorks.
- Updated the display when importing a 2D Polynomial Calibration to show the prescale algorithm ID. Previously this always displayed 0 (zero).
- Updated the format of the display for the Pad Controller and Pads information. Included the physical numbering of the pads.
- Updated the CIT Program dialog to detect if an MFL section is connected to the Memory tool. If the MFL section is connected the pad mask, and tool configuration dropdown list is updated based on the detected tool. If no tool is connected the default tool will be based on the currently set pad mask (acquisition parameter in the memory tool).
- Updated the default curve names for CIT data to reflect the Pad numbering (MFL01 – pad 1, MFL02 – pad 2 ..etc..) versus the controller index. Updated default ACT for SRO logging to use the “center” Flux Leakage sensors vs. end sensors.
- Updated ASCIIWriter (used with time indexed data) to prevent a String index error when the curve name is less than 4 characters.

- When creating a new Project database, if the user omitted the extension the program may create a database without an extension (*.sdb) (if there was a "." in the filename). This created other potential ripple effects. Interface was modified to automatically add the extension if omitted.
- Update System database to support 8 characters for Short Curve Name. Previously this was limited to 4 characters for backward compatibility with some ancient data export formats.
- Increased data resolution in the Calibration forms to support up to 8 fractional digits. Previously this was limited to 4 to 6 digits depending on the utility. Change was required to support higher resolution tools.
- Corrected for "overflow" of 32 bit unsigned number if the CIT memory is full. Previously next flash address would report 0 bytes (empty) instead of being 4,294,967,296 (full).
- Updated CIT Diagnostic window. Changed tool type edit box to a drop down list of valid tool types.
- Updated CIT Main Window to allow direct access to ACT Manager (vs. Memory Program Manager). Modified the Calibration View to now access all of the CIT Sensors Calibration Status (vs. SRO Logging Sensors).
- Added a new GUI for collecting and viewing data from the CIT USB interface. The tool will provide a mechanism for efficiently collecting, storing, and verifying calibration data for the CIT.
- Updated the Calibration File Reader to support tools with more than 99 channels. Previously the format of the KEY's ([CAL02603]) in the file format was limited to 2 characters for the channel number. (CIT Tool has over 160 Channels).
- Corrected a potential issue with saving Calibration data to the database. It was possible that the coefficients would be saved but the associated "calibration data" was not saved corrected. This was caused by the wrong CalID being associated with the data. This was not reported previously.
- Added a new feature to the Calibration Status window to automatically import updated Calibration Files to the System.xdb database. Calibration Files (LXXXXX.cal) imported must be in the Cal Folder (All Users or Program Data). You can now select and delete multiple Calibrations stored in the database.
- Displayed an additional programming parameter, "acquisition cycle time" on the memory tool program GUI. The acquisition cycle time represents the time required to complete the acquisition of all sensors. This time limits the ability to do higher sample rates. For example, if an acquisition cycle takes 0.4 seconds to complete; the maximum sample rate would be 2 samples per second (0.5 second sample interval). Additional error checking has been added to help QC the Memory Tool Program.
- Removed the LogScaleCurve objects from the LogEdit View and Log View. With a large number of curves these objects were using an excessive amount of Windows resources (using too much memory, slowing down the system). Impact the cursor will no longer change when hovering over scales, however, if you double click the scale it will still open up the form to allow modification of the curve presentation settings. This improves the start up of LogEdit, as well as corrects "some of the previous memory limitations.
- Added support and control for the Borehole Gravity tool.

SparWorks v1.4.2 (CIT Beta Release Only)

- Added new feature that allows the user to create a new log pass from a SRO recorded raw data file. New feature will create a new log pass based on start and end depths of the file (SDB*.sdr), and user input on the start time for the log.
- Added a new check to verify that the ACT loaded from the Project file, matches the ACT associated with the SDR File that was recorded. Previously if moving files from different machines the ACT ID may match, but it

referred to a different ACT. New feature will allow creation of an ACT based on information stored in the SDR File.

- Added additional error checking for SDR File handler (eliminated errors associated with a file that no longer exists on the user machine).
- Updated SparWorks to handle the second generation CIT Tool (diagnostics, programming, and downloading).
- ACT initialization will read both the default flag and sensor name from the sensor table. This information is used to determine default curves for CIT for SRO logging, and the default curve names.
- Sensor Table in the System database controls which sensors are automatically added to a default ACT. This table is setup by the manufacturer, but can be modified by the end user (newer versions will always have the manufacturers defaults). This supersedes the previous implementation “hard coded” method to remove non-critical sensors from ACT Auto builds (X-Y Caliper Temp Curves).
- Corrected a potential error that would cause invalid “negative” depth values due to a counter “under flow” condition. Problem has not been reported, but may occur under certain conditions.
- Curve Merge Utility: Eliminated potential duplication of curves, when the user adds curves to merge window, then creates a log pass, then selects “Save” (saves the curves), then clicks “OK” which adds the same curves again. Software has been updated to mark the curves saved when the log pass is created the first time, which eliminates the duplication on the second save. Problem was created with a new feature (save button) in version 1.4.0, which allowed the user to work on multiple passes without exiting the utility.
- Updated logic that is used to remove sensors from the Memory Master (Compact PLT, Memory, etc..). Primarily used in tool diagnostic when running in Memory. Previously this logic assumed it was the top tool in the ACT Tool Configuration. This may not always be true.

SparWorks v1.4.1 (December 28, 2011)

- Added an option when reprocessing SRO data to create a time indexed curve from a depth based recording. Currently, to record and plot stationary data, you must select stationary mode (creates a simulated depth). If the user forgets to do this, then it is not possible to recover the data as stationary data. This new features allows recovery of stationary data (a simulated depth curve is created automatically).
- Modified the method for processing SRO data to account for extremely large data sets associated with stationary data passes. Previously depending on the machine resources, the system could give an “out of memory” error.
- Updated memory handling in the Merge Utility to force a release of memory after creating a log pass. Previously the system did not automatically release the memory, which could create an “out of memory” error when working with large files.

SparWorks v1.4.0 (October 20, 2011)

- The Curve Merge utility in Log Edit has been updated to allow “quick” adding of curves and well objects to an existing Log Pass. Previously a new Log Pass would have to be created each time, and you would have to exit the utility. When adding curves or well objects to an existing or new Log Pass, you are not creating a copy of the curve or well object, you are actually creating a link to the curve or well object. Any change to a curve or well object will be reflected in all log passes where these objects are linked. This feature is especially useful when sharing a well object among multiple passes in the same well.

- In version 1.3.0 and higher we introduced a new option that “automatically” copied and updated all of the Curve Presentations from the last opened Project Database to a new Project Database. This feature was automatic and created some problems for our “power user” clients. This feature has been modified to copy only presentations with a different name than the Master Template (SparPLT.xdb). This ensures that we do not create duplicate presentations, and we preserve the master defaults. The user is free to copy and clone any presentations. If changes to the default presentation are made, they should be renamed to preserve these changes in new presentations (or update the master). They need to be aware that only presentations with a different “name” will be copied.
- Reviewed the numbering convention used for Program Step / Schedule used in SparWorks. Previously it was indexed from 0 (i.e. first step was step 0). We made a change for one client and on some screens the start is indexed from 1 for the “first step or schedule”. This created some inconsistency in various reports, and forms. We reviewed all instances and the externally report program steps/schedules are now indexed starting at 1. The default name created for the program steps is also consistent with the manually added steps (these can be updated by the user).
- Updated the UTM Conversion tool to support most off the Standard Geodetic Reference Datum and Ellipsoids: Airy, Australian National, Bessel 1841, Bessel 1841 Namibia, Clarke 1866, Clarke 1880, Everest, Fisher 1960 Mercury, Fisher 1968, GRS 1967, GRS 1980, Helmert 1906, Hough, International, Krassovsky, Modified Airy, Modified Everest, Modified Fischer 1960, NAD 27, South American 1969, WGS 60, WGS 66, WGS 72, and WGS 84 / NAD 83.
- Units interface was updated to allow changing and setting Weight (Mass) units. This was required as the tool diagram module displays the tool’s weights, lengths, and diameters.
- Developed a tool diagram generator based on the ACT (Acquisition Control Table). The tool diagram can be inserted into Print Job, as well as standalone prints.
- Updated Print Preview Viewer in the Print Job Editor to “print” the same images being previewed. Previously it would print the selected prints in the Print Job Editor. Viewer was also updated to support the new Tool Diagram.
- Updated the error checking for Tool Program’s and ACT’s to verify and check that the correct “External Tools” are in place when collecting data from a communication adaptor (interfaces to third party tools). If a tool is missing, a message is provided detailing the missing tool.

SparWorks v1.3.2 (January 24, 2011)

- Updated LAS export utility to include Latitude (LATI), Longitude (LONG), License (LIC), Geodetic Datum (GDAT), and UTM Coordinates (X, Y, ZONE) in the Well Information Section. Previously, Latitude and Longitude were included in the parameter section. This will ensure the well information meets the requirements for the updated LAS format specification.
- The Data import utility was updated to read LATI, LONG, and LIC from the Well Information Section. Currently will only read LATI and LONG if they are in decimal degrees (vs. DMS). UTM Coordinates are not imported.
- Updated the Wellbore Information Form to include a location converter from DMS (Degree, Minute, Second) to Decimal Degrees (vice versa). Removed the previous pop up form used for this purpose in version 1.3.1.
- Update the Wellbore information Form to include the Universal Transverse Mercator (UTM) geographic coordinate system. All data is still stored as Latitude and Longitude. Conversion uses WGS84/NAD83 Geodetic Datum for conversions.
- Added exception logic handling, to automatically correct an invalid UnitGroup ID stored in the user registry. Previously the program would throw an exception error, and the user would have to manually correct the registry setting for UnitGroupID (assuming they knew how to do this).

- Updated Merge Utility to import SRO Recorded Encoder files.
- Corrected an issue with importing ASCII Date Time Data into the Merge Utility. Previously the Column Header was required to be "Date/Time". It now also supports "Date Time" as a valid Column Name.

SparWorks v1.3.1 (December 6, 2010)

- Updated LAS import utility to deal with Null Curve Descriptions, and missing units in the Curve section.
- Updated LAS import utility to handle an empty "Well Name Field". Previously if you updated the project information from a LAS file, if the Well Name was blank or empty, an error would be thrown. The Well Name will only be updated if the String Length returned is greater than zero (required field). Blank or Null fields will not update the Project Information.
- Updated SparWorks and SparPTA graph libraries to incorporate a new zoom feature and handle larger datasets more efficiently. The zoom now allows the user to view both the zoomed region, as well as the full dataset.
- Increase the precision of Latitude, Longitude, and Magnetic declination to 8 fractional decimal digits (Forms, LAS File). Modified the log header format for Latitude and Longitude to DMS (Degrees Minutes Seconds).
- Corrected a File Path Null error. This error will only occur if no previous project database has been opened prior to the user creating a new project database. Error is associated with a new feature in v1.3.0 or higher where the presentations from the previous project database are automatically copied to the new project database. Work around is to close SparWorks and "browse" to the previously opened project database.
- Updated the System Database with the new 1 inch Diameter Production Logging String for 177C operation. System database was also updated to clean up the Tool Descriptions.

SparWorks v1.3.0 (October 21, 2010)

- Added option to continue flash memory download after an error occurs in verifying the tool program. Option only applies to the new USB Memory board Rev B (CPLT, CCM, and MPLT).
- Added option in the merge utility to allow processing of memory data with the loaded tool program (when the program in the tool is invalid or corrupt).
- Add new Utility to allow the editing of the Log Run Memory File Information. Allows user to view the associated files, select new files, change the associated MPLT Program, and view and set Start Time.
- Correct a bug introduced in v1.2.24 when parsing ASCII files. The parsing utility would fail for other file types other than Comma Separated Files or LAS. The workaround would be to convert the ASCII file to a CSV file using Excel and then import the data.
- Modified the ACT Auto-build and Create Default Methods to eliminate Non-Critical Sensors. These sensors can be added manually. Non – Critical Sensors:
 - Temperature Curves from the X-Y Calipers
- Added a new Diagnostic utility for Tool Modules Connected to the new USB Memory Tool. We are now able to query tool module information and data from the tools connected to the Memory Tool from the PC. Currently the user can read and update serial numbers and tool types, and view tool version information, as well as read data from any channel (24 bit value). This "Tool Monitor" allows the user to view data from any of the sensor modules connected below the Memory Master (Rev B, CPLT-E, or CCM).

- Updated the Sensor List Description in the ACT Tool Configuration Window to include the full curve name assigned to the sensor.
- In the Log Run information screen of the Project Manager, the Log Measure Depth will only ever use the Drilling Measure Depth value. This reported bug has been corrected. Log Measure Depth is saved and displayed properly.
- Corrected a bug when importing ASCII File with missing sections (~P ~O etc..). When searching a large file for the LAS Sections, the "Mark" would become invalid if the section was not found (and the file was large). The file would not be reset properly to the beginning. Program has been updated to allow a search of up to 65K Bytes for section information. If the section was not found within that range, that specific data would not be read. This limitation should not impact users, but is being documented just in case.
- Updated default output file name in Data Export Utility to the full Log Pass name. Previously this was parsed to include only the first word in the log pass name.
- At the request of a power user, we have updated the utility that updates the System database to the latest version to first check for changes made by the user to the Curve table. If the user has made changes for the default curve filter values, display name, or other presentation defaults, these are NOT LOST during a System database update. User must select Cancel to preserve their changes to the Curve Table.
- Corrected the display name for Cable Head Current in the System Database (previously it was the "Display Name" was Cable Head Voltage). This will show up as a change to the Curve table when updating the system database.
- System database was updated to reflect the correct lengths and sensor offsets for the X-Y Caliper tool (new tool). All tool modules and measure points were also reviewed and corrected if required.
- Corrected an "array index out of Bounds exception" that may occur when processing curves that use a secondary curve index (such as pressure calibration) and the secondary curve index is invalid. Previously an error would occur and stop processing. This error is now handled and the calibrated curve is not computed. To correct the root cause the corrupted calibration needs to be fixed. Data can be reprocessed if this occurs.
- Added ICON to the status bar of the Main SRO PLT window and the Memory Depth Encoder Window to indicate if a FTDI USB (Spartek) or Serial Device is connected to the PC.
- Minor bug corrected: In the Memory Depth Encoder window, after selecting the "Download to PC" button, a dialog will come up telling how much data is on the LMS. You had to press OK twice to start the download.
- Updated the LMS USB interface to look for high speed USB and optimize settings for the port versus the standard serial port or a USB to Serial Port Interface. This will improve communication reliability when using the high speed USB interface.
- Updated the SRO Panel USB interface to look for high speed USB and optimize settings for the port versus the standard serial port or a USB to Serial Port Interface. This will improve communication reliability when using the high speed USB interface.
- Updated the Status bar panel for PLT, MPLT, CIT and LMS to show the serial number of the USB device connected.
- Added a function to test the memory tool program to ensure the minimum sample interval selected does not violate the amount of time required to complete a full acquisition cycle. Previously, depending on tool type, it was possible to build an invalid memory tool program. (Problem was introduced with the introduction of array tool data). This will not correct or check memory tool programs that were created in prior versions of SparWorks.

- Updated the SRO Panel data processing routine to look at surface data and/or the downhole data block. Previously if an error existed in either data block, the data was ignored. Now, if an error exists in the surface data block the data is ignored, however, if the surface data block is verified, it is processed, then the downhole data block (embedded in the surface data frame) is checked and processed (if validated). Allows surface data to be processed and recorded even if downhole tools are not connected.
- When creating a new project database, the system will automatically copy all of the Curve Presentations from the last opened Project Database to the new Project Database. If the default presentations were updated, these changes are also preserved in the new Project database. This new process is “automatic”.
- Corrected reported issue when importing a calibration file which included a “secondary curve” as part of the calibration (2D Polynomial). Previously, the software would not properly save the secondary curve information, unless the coefficients were calculated again.
- Added a new feature to the 2D Calibration and Temperature Corrected Calibration Forms. Now the user can see the Calibration Equation Coefficients and Fit Errors when one reviews a saved calibration (from database) or importing the calibration from a file. Previously, you had to recalculate the coefficients to see the resultant data. Now you can see the results of the current “Fit”.
- Added a new feature to the Polynomial Calibration Method. A message log has been added to the form to display the calibration coefficients, as well as the fit errors based on the calibration data. This is now consistent with the 2D Polynomial Calibration Methods.
- Updated the Temperature Corrected 2D Polynomial Calibration Method to store temperature calibration data in internal units (degK). Previously if the Units were “changed” in the Unit Selection, the data would no longer be reported correctly (there was no unit conversion). Now the temperature units are converted properly. This will not impact the previously stored calibrations (the coefficients), however the calibration “data” stored previously will no longer display correctly. This primarily impacts the new Acoustic Density tool. To restore the data, reload the calibration from the Cal File provided with the tool.
- Extended the EPROM configuration size used to store the tool string information in the new Memory Master Board (Rev B, CPLT-E, or CCM) from 516 bytes to 776 bytes (no firmware change required). This was required to correct an issue with the power on verification of the tool string configuration. Previously if a non addressable tool was included in the ACT (such as pressure bulkhead), the Memory Master would not verify the tool string because the addressable string was different than the ACT Tool String. We are now storing both the addressable tool string and the ACT Tool String in this section of the tool EPROM.

SparWorks v1.2.24 (May 3, 2010)

- Updated the program report to include additional client specific parameters. Default values for these parameters were also updated at the client’s request.
- Updated the ASCII Reader to improve its ability to read comma or tab separated formats which have fields missing. The real time data format has also been improved to parse most common date time formats.

SparWorks v1.2.23 (September 25, 2009)

- A new feature has been added to compact and repair the system.xdb file. Located on the main window under Tools->Repair System Database.
- If updating a very old System.xdb file (2006 or earlier), the update utility would fail because the table ACTToolCfgExt was not present. This issue has been corrected.
- Updated installation program to move the “Disclaim.txt” file to the “All Users” application folder (C:\Documents and Settings\All Users\Application Data\Spartek Systems). Previously this file was located in the program

files directory and was moved to support Vista requirements. If the file is missing the default disclaimer text is printed on the log header.

- Added log file when exporting RDR file. Provides basic information on steps associated with the rdr export.
- Updated processing support for the new memory board to include the Acoustic Density (processing ID =12)
- Updated the system database to include the new X-Y Caliper, and 2.125 Inline flowmeter.
- Added new feature to prevent multiple versions of SparWorks from being launched. If SparWorks has already been launched and the user attempts to open a second copy of the same application, the second application is terminated and focus is moved to the currently running version of SparWorks .
- Updated the source control GUI and supporting classes to support new convergence algorithm from the CAM.
- Updated the curves associated with the ACT when switching the memory file (Memory Production Logging Main Form). Previously we updated the tool string and other views associated with a memory file. However we did not update the associated Curves. This could cause a potential issue when attempting to calibrate a curve associated with the current ACT (if the previous ACT was different). This issue was never reported. It was found during internal integration testing.
- Added a new calibration algorithm, Temperature Corrected 2D Polynomial Calibration. This new method allows the user to enter raw data, and calibrated temperature to determine calibrated value. The system has been updated to allow the user to choose any downhole temperature sensor to perform the temperature correction. If no calibrated temperature sensor is available, the system will default to Standard Temperature (20.0°C). The user can check or change the Temperature sensor used in the Calibration Status Window.

SparWorks v1.2.21 (April 24, 2009)

- The updated 1161D Memory Board used in the Memory Master Controller does not utilize the Accumulate flag in the programming table. This change creates a table mismatch when attempting to recreate the tool program from the downhole tool data. The reconstruction algorithm did not differentiate this change and a table mismatch error would occur during tool program reconstruction. This has been corrected.
- Modified the names of the Auxiliary Surface Channel (0, 1, 2, 3) to match the label used on the LMS and SRO Panel (Channel A [1], Channel B [0], and Channel C (Tension) [2]. Channel C is labeled as Tension on the LMS. Previously the naming conventions were not consistent with the labels used on the surface acquisition units.
- Updated the Tension curve being displayed in SRO mode from defaulting to Channel 0 to default based on the Curve Name ("Tension"). Previously to see the tension curve in SRO mode, the device must have been connected to Surface Channel "B" (Channel 0).
- Updated several modules to provide real time processing support for the density measurement from the Acoustic Density Tool.
- Added a new mode to SRO mode to better support stationary logging. The system will automatically switch the system to time drive. Real time depth values are preserved. Additional effort will be forth coming to provide full support for stationary logging (Plotting, and Data Export).

SparWorks v1.2.20 (December 8, 2008)

- Updated USB Drivers in the install package to version CDM 2.04.06. These drivers support all windows operating systems, including the 64 bit versions. The user must remove the older version of the drivers prior

to installation. **(Note: It is not necessary to install the new drivers on a machine where SparWorks is already operational).**

- Updated the KeyLock Driver to the latest version 03.28.08. Fully supports all versions of Vista, as well as 64 bit Windows OS. New version cleans up the issue of having to do an “uninstall” prior to installing the latest version of the driver.
- In version 1.2.19 we added the feature to update the tool string view based on the actual program and act used for the dataset that was downloaded (Main MPLT Window). This would automatically change the tool program and ACT loaded (if they are different or did not exist). The Main MPLT interface is updated to support both features. The Program and ACT will only be updated under the following conditions: (i) the users selects a new Project (including LogRun), or (ii) the user changes the index of the Memory File. During Auto Program and when the user selects a Program, this selection will be persistent (previously this would revert back to the Program associated with the Memory File already downloaded).
- Updated SparWorks to support the new Rev B MPLT Board. Tool Type 50. Updated Systems database required for new tool.
- Update memory available calculation to account for new data format and flash size for the Rev B MPLT Board (Flash Total Size: 134,217,728 bytes). Corrected error in previous memory available calculation
- Corrected a potential issue with the new Memory Production Logging Tool Program Report. On some machines (very rare), the report did not print the Curve Name, Sample Rate, and ACC Flag in the Program Table. This problem is most likely related to the “fonts” available on a given machine. Field sizes were adjusted to deal with the potential issue.
- Corrected indexing error for dot, dash, dot-dash, curve line types in Log Edit (still only works for curve thickness “Thin”). Currently working on trying to resolve the issue of why the line types do not print consistently.

SparWorks v1.2.19 (August 11, 2008)

- The Tool String view in Main MPLT Form is now updated based on the current MPLT Program and ACT.
- The Tool String view in the Merge Data Form is now updated based on the current MPLT Program and ACT.
- Initialized the LogRun date/time picker controls to the current date if value has not been set (Edit Mode).
- Modified the display and input of “Time” on the Memory Production Logging Programming Interface to HH:mm:ss format.
- Added a new utility to view and print a report detailing the Memory Production Logging Tool Program.
- Updated the default sample rate for the MPLT based on tools connected. Also set the default sample time to be equivalent to 12 hours (previously it was based on total samples versus time).
- Added Multi-Select and Delete options for the Acquisition Control Table (ACT) manager and the MPLT Tool Program manager.
- Updated the Name listed in the Tree View of the Project Manager after “Edit”. Previously, the Tree View was not refreshed if the user modified the Name of the object (Project, Well, Wellbore, LogRun, or LogPass).
- The MPLT and CPLT Program Step display was updated to start with Step “1” versus Step “0”.

- The MPLT and CPLT programming screen has been updated to show “Duration” in the format “HH:mm:ss”. Previously this was always displayed in minutes only. The time now also includes the time associated with the initialization, pre-acquisition directives, and post acquisition directives.
- Updated SDR Utility to read a SDR File from one Directory and store resultant file in a different directory. Previously, both directories had to be the same or an error would occur.
- Removed the field “Address” from ToolMaster table (no longer used). Cleaned up associated code.
- Decreased sleep directive for source control to 120 seconds. Updated delays associated with data acquisition for the communication adaptor.
- If the CIT is in the tool string, SparPLT will send a time stamp to the CIT at the start of recording a log pass. This time stamp will provide easier means to tie the memory data to the real time recorded log passes.
- Updated the CIT Control Form in SparPLT to properly enable/disable when in record mode, added a numerical display of percent memory used, and ensured the system was returned to the original state after sending commands to CIT.
- Corrected a potential “null pointer error” during downloading of memory. If the user attempted to download data from a tool which has not collected any data, and the tool program did not match. A null pointer error would occur, because the first header record in the tool was not created (for CPLT-E only).
- Added additional logic to the Download Memory Tool Dialog to verify USB is connected, as well as to reestablish connection within the dialog. Previously the user would have to exist and reopen the dialog.
- Added “Cancel” button to the Download Data Range dialog. Available for all Spartek Memory based tools and equipment.
- While downloading data from a memory tool or when merging data, the SparWorks compares the “current tool program” (ACT) with the program information stored in the tool or data file. If there is a mismatch the user is notified and a new tool program is constructed based on the actual program used to program the tool. This comparison would fail if there were no external tools. Comparison was updated to account for “empty” number of external tools. This only applies to the CPLT-E which allows the use of communication adapters.
- Updated Program Memory tool sequence to include the following test: a) Verify the active communication port, and b) Send a Check Parameters Command prior to erasing the flash. The purpose of these tests is to ensure a valid tool is available prior to sending the command to erase the flash (very long time out).
- Updated service name field in RDR Export Utility to support subset numbers, and other third party tool string configurations.

SparWorks v1.2.18 (January 11, 2008)

- Open Project Database Dialog (GUI) has been updated based on user requests. The new dialog eliminates the radio selection, and uses a button for each option.
- Eliminated the potential of the same Project Database being listed twice in the recent file list. Previously this occurred if the user moved or deleted a project database. The “last entry” could be a duplicate of a previously opened Project Database.
- Added the Encoder Settings to the System.xdb database migration update. Previously this table was not included the database migration routines.
- Updated the tab order on the General Calibration Form (Polynomial Fit).

- Corrected index array out of bounds error when a user creates a Memory Program, but does not create any program steps. (Error introduced by the new battery use calculation).
- Correct index array out of bounds error when a user attempts to view a memory production logging data file that does not have a valid header. (Number of headers found is zero).
- Added an error message: When programming a tool with an invalid tool program (invalid ACT, no program steps, etc), the Program tool form would indicate an array out of bounds error. A more descriptive message was added to replace the automated error message.
- If an ACT is not valid or not available, all tool information, and ACT Items are flushed. Previously there was the possibility that this information would not be cleared on some forms.

SparWorks v1.2.17 (October 25, 2007)

- Corrected an error in the number parsing utility. Updated version did not handle “comma’s” as grouping character (1,000’s). Primary error noted was that the depths in Data Export did not function due to the “commas” in the number String.
- Updated the data parsing routing for the new CPLT-E. Previous version did not handle multiple power-on resets during an acquisition cycle. (No impact to field locations, as tool is not released). Information in the Log file (result of parsing) was updated to include Real time Clock, Program Schedule being processes, and current cycle count from the tool.

SparWorks v1.2.16 (September 27, 2007)

- Directory structure for SparWorks has been updated to meet “User” requirements on Windows Vista. The Systems.xdb, Calibration Files, and other files have been moved.

From: “C:\Program Files\SpartekSystems\SparWorks”

To: “C:\Documents and Settings\All Users\Application Data\Spartek Systems\SparWorks”.

This eliminates the need for the user to be an administrator on the Vista machine, in order to run the application. Normal “Users” are not allowed to write information in the Program Files Directory.

- Updated support for data export for third party tool strings.
- Corrected a potential “null pointer” error when the user has multiple program steps with ACT of different lengths. The error would occur in the Program Control (Program Tab).
- Updated Project Control Manager to allow automatic population of Project Hierarchy down to Log Run. (Requested new feature).
- Updated Project Control Manager, so a right click would also “select” the appropriate item in the Tree View control. Previously it would appear that an item was selected, but in reality it was only highlighted. Issued occurred when using the context menu with a “right click”.
- Corrected a potential “Null Pointer Error” when editing, adding, deleting, or selecting a Project, Well, Wellbore, Log Run, and/or Log Pass from the Project Manager Window. This error occurs if no item is selected from the Tree View, and the user selects one of the functions (edit, add, delete, or select).
- Export of ASCII data from the Depth Encoder (SparDepth) interface has been simplified to allow ASCII data export (text, comma separated, and Excel) of the raw data files. This will allow the user to “easily” import Spartek’s LMS data into third party software packages.

- Corrected a data parsing error when merging data from the MPLT. If the user disables or uncheck the AcqFlg (acquire data flag) in the programming window. The Merge utility will incorrectly parse the data. This issue only occurs in datasets where the user “turns” off curves via the programming window versus the ACT. **To work around this issue, use the ACT to turn off curves that are not required.** This has been corrected.
- Corrected a potential error when downloading the LMS Box. If the GPS is not installed, and the Eprom area for the sample interval is corrupt (negative sample interval), SparWorks would not allow download of the data to the PC. A condition check was added to bypass this potential error.
- Update Systems.xdb database requirement to version 7, SparWorks Version 1.2.10 or higher.
- Corrected a potential problem with the edit control on the Well Information GUI. On screens set with a DPI setting of 144 DPI (150%), several of the edit controls were not accessible. To work around this on previous version of SparWorks, reset the DPI to a lower setting (96 dpi is standard for most machines).
- Upgrade the project information GUI's (Project, Well, Wellbore, LogRun, and LogPass) to support “Save” and “Cancel”.
- Change the label for the Depth Calibration routine from “Set Depth 0” and “Set Depth 1” to “Set Depth 1” and “Set Depth 2”. This was changed to avoid confusion of Set Depth 0 meaning “Zero Depth” versus the first calibration point.
- Corrected the “Enable Acquisition” in the Depth Control. Previously, the system would ask the user if they wanted to enable acquisition (if acquisition was disabled). If the user selected yes the command would fail.
- Added two new raw data processing functions ID=3 is 24 bit signed integer value, and ID=4 24 bit inverted signed integer value.
- Update the System database to include “real time” support for the Spartek Systems Casing Inspection Tool.
- Corrected a potential issue with reading parameters from the Optical Flow Meter (rarely used command). If the tool was still acquiring data, the command would be intermittent.
- Modified main forms for SparPLT, SparMPLT, and SparDepth to ensure they are “top most” when activated.
- Added CIT Control panel in SparPLT to control the Spartek's Casing Inspection Tool (CIT).
- Corrected a unit conversion issue when editing the tubing weight in the Log Header. When adding the value the tubing weight was not converted to internal units. Work around is to edit the value (will correct the unit conversion issue).
- Added error checking to prevent the use of invalid characters in file names (\ / * ? : “ < > |) when exporting data (LAS, ASCII). Previous error message was not descriptive.
- Allowed the user to manually enter in Serial Numbers when doing a manual Tool String Configuration.
- Production Logging String now supports the use of Communication Adapters. Database has been updated to incorporate data from measurement from such adapters.
- Corrected a potential error in the dual pressure density calculation if the time curve has an empty value (calculated an array index out of bounds).

SparWorks v1.2.8 (June 6, 2006)

- Added a new dialog for open/creating project database. SparWorks now maintains a history of previously opened project databases.

- Added one more level of warning to prevent the accidental overwriting of an existing project database when creating a new project database.
- Corrected the “display issue” of LogEdit and LogView on machines that were using 120 DPI fonts (vs. 96 DPI). The GUI was being auto scaled by windows to match the font selected. This “auto scale” by Windows was distorting the scaling for LogEdit.
- Updated the presentation option dialog in LogEdit to save the last presentation used for a log pass. The last presentation used to display a log pass will now be associated with the log pass.
- Added the ability to read external ascii depth format (no time, but included date/time).
- Corrected a bug when importing data with “Time” field in the ascii data (was not being handled properly).

SparWorks v1.2.5 (March 9, 2006)

- Updated/Added the Export data to provide full support for exporting time based data, as well as support of data with no indexing (“None”). This provides mirror support to the new Data Import tool.
- Corrected the handling of empty values when converting units. Previously the “empty value” (e.g. –999.25) was converted based on the unit selected (primarily an issue when exporting and importing data).
- Corrected unit conversion error when importing data. Previously the data was converted and stored as “internal units”, however the curve header implied it was in “external” units.

SparWorks v1.2.4 (Feb 15, 2006)

- Updated/Added the Edit Depth and Edit Time to the Merge View. Feature allows for global correction to the depth and time prior to merging the data.
- Updated Data IO Export function to include comma separated format (*.csv).
- Corrected potential bug in outputting column headers. If Line Number, Date Time, and First Curve is Date Time, Line Number Label will be missing in the ASCII output. Condition is rare for MPLT, PLT data.
- Add new Import Data function. New module allows the user to import depth or time based data into the ODBC compliant database. Current formats supported include:
 - CMP – Compensated Pressure data file (Spartek)
 - CMT – Compensated Temperature Data File (Spartek)
 - CPT – Compensated Pressure / External Temperature File (Spartek)
 - SDF – Spartek Data Format (Binary Data Format)
 - ANC – Spartek MCSRO Data Format
 - TXT – ASCII Data Format
 - CSV – Comma Separated ASCII Format
 - ASC – ASCII Data Format
 - LAS - Log ASCII Standard Format
- Added Auto ACT Builder. System will automatically create and ACT based on the tool string connected, and initialize the master controller.
- Added Auto Tool Program Builder. System will automatically create and program the MPLT Tool String.
- Added Lock Code to MPLT Diagnostics.

- Improved speed of importing curves into the database (e.g. raw data file (SDR) to database). Previously, on large databases (many curves, or large curves), the process was slow and would get slower as the size of the database increased.

SparWorks v1.2.1 (Mar 11, 2005)

- Added Log Annotation capability
- Added ability to generate print jobs
- Added well sketch capability

Separated out major modules from SparPLT (Depth Encoder Support, Memory Production Logging, LogEditor, etc..)