AS950 Firmware Release Notes

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| --- | --- |
| **Product Name / Model:** | Hach AS950 Firmware |
| **Version:** | Application **v1.11**, Boot **v1.01** |
| **Primary Device Version:** | **V1.02** |
| **Date:** | **Tuesday August 30, 2022** |
| **Project No.:** | R9001 |
| **Part No. / Board No.:** | Firmware: 9490379, Ckt Bd: 9490200 |
| **Technical Lead:** | Austin Haigh |
| **Target Processor:** | Hach p/n: 9490300, Mfg p/n: LPC4357FET256 |

**Document Overview:**

This document lists differences between a product and its predecessor version. Differences are categorized as defects which have been corrected, improvements, and new features. The tables used to list each category of differences are all structured identically. Item numbers are sequentially numbered differences. Tracking numbers refer to issue tracking systems. This product uses {later} to track version differences. External communication indicates whether the difference should be reported to external parties outside of Hach. This column should be Y/N for Yes/No. When an external communication item is marked “Y”, the description should be written for laymen (i.e., avoid technical jargon).

# Version V1.11

The release date of this version is **August 30, 2022**.

## Defects

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  |  |  |

## Improvements

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  |  |  |

## New Features

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
| 1 |  | N | Update heater and A/C control algorithm to support new A/C hardware |

# Version V1.10

The release date of this version is **May 25, 2020**.

## Defects

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
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## Improvements

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  |  |  |

## New Features

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
| 1 |  | Y | Showing Next sample info for Program Delay on Status screen. |

# Version V1.09

## Defects

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
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## Improvements

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  |  |  |

## New Features

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
| 1 |  | Y | Adding Seconds display in UI title bar for China EPA requirement. |

# Version V1.08

## Defects

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
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## Improvements

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  | Y | Provide access to manual pump and distributor operation in halted state. Previous to this change, the AS950 running program would need to be completed to access manual operation of pump and distributor. |

## New Features

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
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# Version V1.07

## Defects

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  | Y | Adding a patch where ghost key event will be ignored. Many customer are seeing this issue. |

## Improvements

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  | N | Added program fsm refresh from io fsm (AUX mA). Hence, if system is setup for flow placing then program fsm can take sample very quick rather than waiting for next minute interrupt. |

## New Features

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  |  |  |

# Version V0.15 (Test Version)

## Defects

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  | Y | Adding a patch where ghost key event will be ignored. May customer are seeing this issue. |

## Improvements

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  | N | Added program fsm refresh from io fsm (AUX mA). Hence, if system is setup for flow placing then program fsm can take sample very quick rather than waiting for next minute interrupt. |

## New Features

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  |  |  |

Version V1.06

## Defects

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  | Y | Fixed Grab Sample issue when program is running. After this fix, Grab sample will work exactly like sd900 |

## Improvements

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  | N | Removed motor brake when turning off motor. This is fix was need to support old power supply. Chris Tometich has done testing and found none accuracy impact. |

## New Features

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  |  |  |

# Version V1.05

The release date of this version is **August 7, 2015**.

## Defects

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  | N | Fix an assertion in GPIO driver due to Pressurized sampling algorithm. |
|  |  | N | Fixed temperature conversion issue in pH calibration UI screen. |

## Improvements

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  | N | Changed MAXIMUM time limit for valve cycle time. From 60 seconds to 15 seconds. Suggestion suggested by Chris Tometich. |
|  |  | Y | Added support for new pH probe. (Due to new device ID, AS950 is throwing assertion on screen). Now with this fix, sampler is supporting both old and new pH probe. |
|  |  | N | Added program sequence code to test RAIN and RS485 port. This sequence only offers the configuration change back and forth between RAIN and RS485. It does not offer any Modbus baud rate change or device ID change etc. |

## New Features

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
| 1 |  | Y | Added more language support. (Turkish, Hungarian, Czech, Polish, Romanian, Croatian, Greek, Slovenian, Slovak, Finnish, Russian). Added more translated text in to existing supported language. |
| 2 |  | Y | Added new MODBUS registers to access sampler’s system alarms. To view these MOSBUS register map, please use latest FS-Data Desktop software. |

# Version V0.14

The release date of this version is **June 3, 2015**.

NOTE: This release is just the test release not the production release. This version of firmware has the fix (or enhancement) for those two customers whose AUX Pulse width is more than 2 seconds MAX limit. Hence this firmware offers the UI interface to update this timeout period setting where customer can select timeout value in seconds between 2 seconds (minimum) and 300 seconds (maximum). **This test release is only shared with internal HACH and these specific customers who needs this fix**.

## Defects

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  |  |  |

## Improvements

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  | Y | Added UI option which allows customer to change AUX Pulse width time out. Default is 2 seconds and customer can change it up the 300 seconds. |

## New Features

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
| 1 |  |  |  |

# Version V1.04

The release date of this version is **April 16, 2015**.

## Defects

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  | N | Few production boards experienced not booting up normally. Found the problem with External Memory bus communication timing with Processor. Increased the bus timings with good margin and put in this fix in to this version of firmware. External SRAM Read Wait state (***STATICWAITRD***) increased from 5 to 6 counts. This one count increase will give 14.3 ns of margin. No timings changed for NOR flash. |
|  |  | N | Since the ***HachFrNoto*** font render invalid character for superscript **3** (used in units like m3), replaced them with normal **3**. |

## Improvements

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  |  |  |

## New Features

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
| 1 |  |  |  |

# Version V1.03

The release date of this version is March 31, 2015.

## Defects

## Improvements

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  | 7439 | N | Used non accent characters instead of erroneous characters from HachFrNoto font.   * Replaced à with a * Replaced è with e * Replaced ê with e * Replaced Ê with E * Replaced ì with i * Replaced ï with i * Replaced ñ with n * Replaced ò with o * Replaced õ with o * Replaced ù with u * Removed ¿ |
|  | 7428 | Y | Fixed an issue with USB host assertion in TFATFileSys.cpp. |

## New Features

# Version V1.02 (Not released to production.)

The release date of this version is March 30, 2015.

## Defects

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  | 7198,7426 | N | Removed the feature to auto detect newly connected sensor and to prompt with a UI screen instructing user to perform sensor configuration. This feature is causing more problems than its worth, and breaks the use model. |
|  | 7422 | N | Fixed an issue in UI screen navigation through hard keys, while on sensor calibration verify summary screen. |
|  |  | N | Since the “***HachFrNoto***” font incorrectly represents few of the Latin-X characters, replaced those erroneous characters with alternatives.   * à with á * è with é * Ê with E * ì with í * ï with i * ñ with n * ò with ó * õ with o * ù with ú * ¿ with space |

## Improvements

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |

## New Features

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |

# Version V0.13

The release date of this version is March 26, 2015.

## Defects

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  | N | Fixed an ASSERT issue in Manual Pump Operate, when Sample Program is Halted. |
|  |  | N | Fixed an issue with Volume accuracy algorithm for AWRS and Refrigerated base type. Grab sample, volume calibration and regular samples must be collected at the bottom of distributor not at the top of the base. |

## Improvements

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  | N | Changed the enumeration order of UI languages to avoid improper language selection while upgrading to CJK release. |
|  |  | N | Updated the Manual Operation UI screen flow to wait for the valve cycle time to complete before checking for the pump run status. |
|  |  | N | Added more safety check for turning on and off the pressurized valve when Pressurized sampling is enabled.  Ex. When pump fault happens then close the pressurized valve so that extra pressure does not build up within the intake tube.  Ex. During manual pump forward operation, when user halts the pump then close the external pressurized valve when pressurized sampling is enabled. |

## New Features

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |

# Version V0.12

The release date of this version is March 18, 2015.

## Defects

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  | 7382 | N | Fixed defect that indicated the sample programs were waiting on an event even though program was ended by user and complete. |
|  |  | Y | Fixed an issue where system was not going to sleep after USB host detection and disconnect. |
|  | 7392 | N | Fixed an issue with Channel Alarm refreshing on UI Status screen. |
|  | 7394,7335 | N | Fixed an issue with USB Import/Export UI screen flow. |
|  |  | N | Fixed an issue with Thermal settings UI screen not updating correct Set point value. |
|  | 7388 | N | Fixed an issue with unit preference handling in US9000 & AV9000 Calibration summary screens. |
|  | 7381,7366 | N | Cosmetic corrections to string definition in Messages.xlsm |
|  | 7396 | N | Added condition to enter into pH calibration failure screen when user disconnects sensor during calibration wait screen. |
|  | 7404 | N | Modified the UI security auto-lock timeout period to avoid locking out while UI is still awake. The timeout period of 5 minutes is now derived from 2 minutes idle until UI goes to sleep and then another 3 minutes while UI is asleep. |
|  | 7248 | N | A 5 minutes timeout condition is added to forcefully monitor power supply when pH sensor is configured always ON. |
|  | 7336 | N | Fixed an issue with restoring defaults for pacing intervals. |
|  | 7395 | N | Enforced UI security restriction for:   * Liquid Detect Calibration * Volume Calibration * Sensor Calibration * Date & Time edit * Run/Halt/End Sample Program |
|  |  | N | Fixed an issue with showing invalid sample cycle state text on title bar. |
|  | 7303 | N | Fixed and issue with Run/Halt menu that allows multiple attempts to Halt/End. |
|  |  | N | Fixed an issue with Event Log file transfer over USB to FSData Desktop after CJK language manager introduced. Introduced new logic to handle strings table creation which does not affect file transfer timings to FSData desktop. |

## Improvements

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  | N | Improved behavior of missed sample by preventing time skew. Time skew is when the time reference for samples changes when a missed sample occurs. If a missed sample occurred, the next sample time is referenced from the time when a missed sample was detected, not the program start. In addition, when a sample is missed, the bottle position is adjusted as if samples were indeed delivered to the assigned bottles. As missed samples are detected, they are logged as missed in the sample history due to a time lapse. |
|  |  | N | Changed naming convention for Analog Input & Output channels.  For e.g.  Analog Input A ➙ Analog Input 1  Analog Input B ➙ Analog Input 2  Analog Output A ➙ Analog Output 1  Analog Output B ➙ Analog Output 2  Analog Output C ➙ Analog Output 3  Flow A ➙ Flow IO 1  Level B ➙ Level IO 2 |
|  | 7395 | N | Disabled Sensor Calibration and Modification to Date & Time, while sample program is running or halted. |
|  | 7374 | N | Added a warning icon () for sensor status, when sensor is faulty. |
|  | 7047 | N | Updated Sample Program Pacing edit screen flow to show reasonable default value after switching the pacing mode. |
|  | 7161 | N | While starting a program run, the configured sample volume is validated against the available bottle size; if samples don’t fit within the bottles, an error screen message is shown. |
|  |  | N | Removed “Ambient Temperature” from Diagnostics menu. |
|  | 7380 | Y | Introduced a new icon () on Status screen to indicate sensor type mismatch between actual sensor connected and the sensor type configured in Datalog program settings. |
|  | 7400 | Y | Removed count values displayed at right hand side of the 'Review Data -> Sample History' menu items. This count value appears to be non-important to users and can only introduce confusions with Status screen data. |
|  | 7373 | Y | Providing continuous +12VDC on Auxiliary Port pin A to use contact closure to create a flow pulse on AUX port. |
|  |  | N | Added 200mS delay between initialization of individual power to IO9004’s AO and AI channels and their respective I2C communication to the chips on the other side of isolation circuitry for better response under extreme low temperature. |
|  | 7226 | Y | Introduced Tubing Life indicator feature. User can set the cycle limit count for the tubing life and diagnostics screen shows remaining cycle count. |
|  | 7198 | Y | When new sensor is connected to the AS950, the UI will prompt user to perform sensor configuration. |
|  | 6798 | Y | Updated UI screen flow to optionally verify the sensor calibration with a new reading. |
|  |  | Y | Disabled Liquid Detect Sensor when AUX port is configured for Pressurized Sampling. |

## New Features

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
| 1 |  | Y | Added support for CJK languages. |
| 2 |  | Y | Added Pressurized Sampling feature. AUX port pin E (Special output) will be used to control external valve. |

# Version V1.01

The release date of this version is February 18, 2015.

## Defects

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  | N | Fix for system is not going to sleep after USB host detection initiated. |
|  |  | N | Added lcdG.DeInit() before the call to CallBoot in both soft reboot and user power on. We believe this was calling the soft boot to occasionally fail when trying to re-initialize the LCD hardware. |
|  |  | N | Update hard fault handler to write system information regardless of whether the system information has been initialized. This should give a chance of diagnosing a hard fault that occurs during initialization. |
|  |  | N | Fixed bug where a key press was unhandled in off state, therefore interrupt was not cleared and firmware did not resume off state. |

## Improvements

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |

## New Features

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| Item # | Track | Ext. (Y/N) | Description |

# Version V1.00

The release date of this version is February 6, 2015.

## Defects

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  | 7361, 7364 | N | Fixed an issue in Graph plotting for Flow parameter. Introduced auto-zooming of graph (y-axis) based on plotted data points. |
|  | 7355 | N | Fixed an ASSERT issue with TUiStateStatus.cpp file. |
|  |  | Y | Fixed an issue with file size displayed on Export Data and Export Settings. |
|  |  | N | Fixed an issue with closing the AS950INF file in Export Data and time stamping it properly. |
|  | 7371 | Y | Fixed an issue with Alarm trigger on RAIN measurement. Rain Alarm SET and RESET was not working based on measured RAIN tip. |
|  | 7354 | N | Fixed bug that caused the controller to occasionally assert when powering down during a sample. |
|  | 7387 | N | Fixed an issue with unit preference handling for AWRS Thermal set-point value. |
|  | 7383,7389 | N | Fixed an issue with UI screen invalidation. After a sleep cycle, PEG Framework requires a forceful redraw of entire screen, Calling Invalidate() doesn't work as expected. |
|  | 7376,7250 | N | Fixed an issue with Sample History log view screen. |
|  | 7385, 7375 | Y | Fixed an issue with Alarm dead band being stored in base unit. Made dead band as unit less value and changed alarm processing logic to take care of non – linear unit type conversion while processing channel alarm. |
|  |  | Y | Sample volume calibration must be done at the end of distributor arm, not at the base (outlet of pump motor). Volume calibration does account the distance from liquid sensor to the end of distributor, hence after calibration is successful, Either Verify or Grab Sample must be done at the end of distributor for accurate sample collection. |

## Improvements

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  | 7377 | N | Redesigned the UI security unlock timeout feature.  When security is enabled, once user unlocks the UI with a password, it stays unlocked for 5 minutes from last key press event. When UI wakes up from sleep after the security timeout period, instead of previous screen the Main menu screen is shown, forcing user to again unlock the restricted menu screens. |
|  | 7378 | N | When secured with a password, the UI does not allow the controller to be powered off. |
|  | 7375 | N | Made Channel Alarm dead-band value unitless. |
|  | 7385 | N | Made Channel Alarm dead-band value an absolute value. |

## New Features

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| Item # | Track | Ext. (Y/N) | Description |

# Version V0.11

The release date of this version is February 2, 2015.

## Defects

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  | N | Removed aligned malloc functions and replaced the mutex protection of heap with a semaphore. Introduction of the Mutex introduced AppMan and TActive assertions. |
|  |  | N | Returned pack attribute to structure that were recently modified to remove the attribute under assumption there was an alignment issue. We now believe we don’t have an alignment issue. |
|  |  | N | Converted PegList::GetSelected() from inline to source file implementation. |
|  |  | N | Fixed bug in USB host that prevented export operation on Sunday day of week. |

## Improvements

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  | N | Improved efficiency of status screen, removed display of data log percent utilization to minimize floating point calculations. |
|  |  | N | Updated system information: replaced support for recording FSM states and with slots for generic debug use. Added stack pointer when hard fault occurs. |

## New Features

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| Item # | Track | Ext. (Y/N) | Description |

# Version V0.10

The release date of this version is January 28, 2015.

## Defects

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  | 7321 | N | Fixed the wrong time stamp for first sample in sample history. |
|  | 7260 | N | Fixed multiple Sensor removed entry from event log. |
|  |  | N | In response to occasional assertions within void \_ttywrch(int ch) within Retarget.c, removed assertion and replaced with functionality to output to debugger console. Without a clear understanding of how this function is being called during runtime, we’ve removed the assertion to allow the firmware to possibly return and continue as normal. If normal operation is not resumed, perhaps the failure point will move to another location for additional clues to root cause. |
|  |  | N | The total sample count was incremented incorrectly when bottles per sample > 1. In bps mode, all volume deliveries to the bottle set is considered the same sample. In this case, the sample count increments only once for the entire bottle set. |
|  |  | N | Made several improvements in UI status screen source code to improve on heavy CPU cycle use. |
|  |  | N | Fixed an assertion issue in PWM driver when device is on OFF mode and its main power is removed. |
|  |  | N | Fixed an assertion issue in Sample History file while browsing through missed sample events through UI Review menu. |
|  |  | N | Modified the sequence of Import and Export settings file. General settings file must be imported before program settings to ensure proper system configuration. |
|  |  | N | Forced right soft key label text to be retranslated on re-entry to Main Menu screen. |
|  |  | N | Fixed an issue of detecting RAIN gauge tip. Issue was caught during RAIN port test on production test bench. |
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## Improvements

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  | N | Added support for RS485. |
|  |  | N | Removed Chip library implementation of I2C driver and replaced with custom to get rid of infinite loops. |
|  |  | Y | USB drive information removed to improve the speed of detection. |
|  |  | N | Implemented HW solution to blank the event handling during the transition from wake to sleep to satisfy LPC4357 errata Rev 1.1 dated Aug 8 2012, section 3.6. |
|  |  | N | Added check to prevent sleep if RTC wake event is imminent and could possibly occur during transition from wake to sleep to satisfy LPC4357 errata Rev 1.1 dated Aug 8 2012, section 3.6. |
|  |  | N | Modified behavior of power on/off to initialize into ‘on’ state when the controller is run for the first time. |
|  |  | N | Wrapped the watchdog kick within a critical section to minimize the possibility of leaving the external counter in a clear state. |
|  |  | N | Added support to store trace information into the system info when an error occurs within the C runtime library. |
|  |  | N | Adjusted the string width for the label texts “Next Sample” & “Last Sample” on Status UI screen, and marked them for retranslation. |
|  |  | N | Added condition check in UI code to ignore soft-key event while selection is invalid, prevents possible HardFault due to null pointer access. |
|  |  | N | Added thread-safety to the C runtime library using a mutex as suggested by ARM. |
|  |  | N | Added support to store trace information into the system info when an error occurs within the C runtime library. |
|  |  | N | Improved efficiency to obtain the last data log time within the Status screen. |
|  |  | N | Provided more time to detect the IO9000 on power up. This guarantees full power to IO9000 before trying to communicate. |
|  |  | N | Optimized the process used by the Status screen to obtain information regarding the sample program. |
|  |  | N | Relocated PEG periodic timer update from the System Tick to the System FSM to minimize processing and heap allocations within ISR. |
|  |  | N | Added trap for C runtime library error and log occurrence in system information. |
|  |  | N | Update rate on status screen reduced from 500mSec to 2 seconds to minimize processing. |
|  |  | N | Removed unnecessary \_\_pack from TInterruptDriver, TTimerDriver, and TEventDriver. |
|  |  | N | Redefined new operator to return 4-byte aligned memory and assert on allocation error. |

## New Features

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
| 1 |  | N | Added feature to disable heap check, set to disabled. At this point in time, there are no known issues with the heap. Therefore, the heap check is disabled to minimize processing. |
| 2 |  | N | Note: A modification was made to this version of firmware to keep the UI FSM, (display), continuously on. This is a temporary modification to allow iron man testing in worst case conditions. It will need to be subsequently removed prior to production. |

# Version V0.09

The release date of this version is January 14, 2015.

## Defects

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |

## Improvements

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  | N | Added extra 1MB of code space to accommodate more language packs. Mainly CJK languages support. |
|  |  | N | Extended system information to include additional information to trace the root cause of hard faults. |
|  |  | N | Increased the keyboard auto delay between first key press and auto repeat to 1.4 seconds to prevent occasional cursor jumps in the UI. |
|  |  | N | Increased wait states on SRAM read from 5 to 6 to resolve theory that memory is being occasionally corrupted because timing is too tight with only 5 wait states. |

## New Features

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |

# Version V0.08

The release date of this version is January 7, 2015.

## Defects

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  | Y | Fixed an issue with detection of sample USB stick. Increased the delay between providing power supply and bus reset, to give more time for stabilizing the Power on USB stick and get ready for enumeration. |
|  |  | N | Occasional assertion is appearing in firmware when system is commanded to go to Power Off mode. This issue was caught multiple times on production test bench. Issue has been fixed and tested several times. The assertion was in TPwrMgmtDriver at line 849. |

## Improvements

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  | Y | Merged reviewed translations file (English, French, Spanish, Italian, German and Portuguese) received from Renee Garcia on Jan 6, 2015. |

## New Features

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |

# Version V0.07

The release date of this version is January 5, 2015.

## Defects

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  | 7316 | N | Fixed an issue with Main Menu, where ‘General Settings’ icon is grayed out during screen navigation (random scenario). |
|  |  | N | To resolve an assertion in TPwrMgmtDriver at line 849, a modification was made the thermal FSM to disarm a timer. |

## Improvements

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  | 7314 | N | When Sample Program Pacing type is ‘Time Weighted’ or ‘Flow Weighted’, hidden the left label text to take care of possible text overlapping. |
|  |  | N | Disabled screen navigation through hard keys for USB Import/Export progress screens. |

## New Features

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |

# Version V0.06

The release date of this version is December 23, 2014.

## Defects

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  | 7301 | N | Fixed an issue with range check for Modbus address in UI editor screen. |
|  | - | N | Fixed Power Off issue when Firmware upgraded or DEBUG mode or Soft Start mode or Factory restored through UI. |
|  | 7183 | N | Fixed an issue with use of AUX pulse as flow source when dual program is setup for sampling. |
|  | 7295 | N | Fixed an issue with WDTR event after power off/on. |

## Improvements

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  | 7135 | N | Removed the auto advance selection feature from Sample Program menu screen. |
|  | - | N | Increased Liquid Detect read time in Sample FSM to 50mS from 10mS. |

## New Features

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
| 1 |  | N | Implemented firmware-based power control. |

# Version V0.05

The release date of this version is December 12, 2014.

## Defects

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  | 7102 | N | Disabled modifications to Liquid detect sensor settings while sample program in progress. |
|  | 7251,  7210,  7230 | N | Fixed an issue with range validation in floating point parameter editor screen. |
|  |  | N | Updated bottle configuration for Portable Compact model type. |
|  | 7213 | N | Added set point sampling. |
|  | 7292 | N | Fixed defect in calculating next switch time in time-based sample distribution. |
|  | 7298 | N | Fixed an issue with floating point value round-off, during unit conversion. |
|  | 7093 | N | Fixed an issue with Date & Time based search in Event Log and Measurement Log view. |
|  | 7302 | N | Fixed an issue with page scroll feature in Status screen. |
|  | 7305 | N | Fixed an issue with Measurement data view screen (Graph/Tabular) showing multiple entries with same timestamp. |
|  | 7306 | N | Fixed an issue with floating point arithmetic in Measurement data Graph view that shown different data from Tabular view. |
|  | 7307 | N | Fixed USB Drive reconnects issue if the user cancels the previous USB detection process. |
|  | 7294 | N | Fixed Export Data and Export Settings issue with 1 GB memory Stick. |
|  |  | N | Fixed an issue with unit display for Transfer output value under Analog Output Basic settings menu. |
|  |  | N | Forced Analog input calibration to be 4mA and 20mA, regardless of the loop scale. |
|  |  | N | Restricted Channel Alarm actions to single AC Relay, when IO9001 is connected. |

## Improvements

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  | N | Redesigned the default PEG message queue implementation (PegMessageQueue) to remove the size restriction (of 40 messages). |
|  |  | N | Removed Battery indicator icon from UI window title bar. |
|  |  | N | Introduced a user confirmation screen for Sample Volume – variable selection. User is prompted to enable Liquid detect sensor, if not enabled already. |
|  |  | N | Introduced user confirmation screen for destructive parameter set in Analog Input & Output settings screen flow. |
|  | 7232,  7229 | N | Hidden the cursor arrow icon from window prompt bar, when there is no scroll available. |
|  | 7225 | N | Removed Pump running animation screens and placed status text on active window title bar. |
|  | 7190 | N | Updated info text on Restore Factory Defaults wait screen to “This may take several moments, please wait…” |
|  | 7227 | N | Added Samples Taken entry to Program Status screen and re-ordered the items. |
|  | 7049 | N | Updated default Date & Time for Sampler Program Time Schedule to current RTC value. |
|  | 7175 | N | Updated default Time duration to 5min, while switching the Delay type. |
|  | 7109,  7163 | N | Added condition check in Pacing editor screens to make sure default values are within allowed range. |
|  | 7200 | N | Introduced warning message screen to show if bottle configuration is invalid while starting a sample program. |
|  | 7174 | N | Updated Graph view to auto adjusts the y-axis max limit based on peak measurement data in view. This provides a zoomed view for y-axis. |
|  | 7028 | N | Updated the text in Level calibration editor screen to avoid user confusion. It now prompts “Enter the value of the current level of water”. |
|  | 7278 | N | Disabled navigation to Datalog Status sub-menu when there are no channels logging.  Disabled navigation to Alarm Status sub-menu when there are no alarms configured. |
|  | 7115 | N | Added condition check to erase Alarm Log, when any alarm is deleted while switching from IO900X to AUX mode. |
|  | 6797 | N | Updated calibration wizards for Senix, Ancho and Digital pH to have Retry option. |
|  | 7299 | N | Added UI restriction to have minimum gap between Min & Max distance range of Senix. |
|  | 7152 | N | Made Analog Input channel parameter type change as destructive parameter. |
|  |  | N | Merged updated message translation file received from Renee |
|  | 7304 | N | Disabled USB Import option, while a sample program is running or halted. |
|  | 7310 | N | Updated main window to correctly reflect the user defined language after firmware update through FS Data Desktop. |
|  |  | Y | Disabled Distributor Arm diagnostics option, while a sample program is running/halted. |
|  |  | N | Added condition check in UI to wait until USB disconnect is complete. |

## New Features

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
| 1 |  | Y | UI Security |
| 2 | 7215 | Y | Introduced ‘Sample Program End – Time Period’ |
| 3 |  | Y | Sampler Program Template |

# Version V0.04

The release date of this version is November 13, 2014.

## Defects

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  | N | Fixed USB Host mode power management issue. |
|  | 7195 | N | Disabled the distribution setup option, when the Total bottle quantity is 1 or Bottles-per-program is 1. |
|  | 7139 | N | Fixed a bug in unit conversion while displaying measurement data in tabular view. |
|  | 7220 | Y | Fixed the bug found in FSData Desktop which displayed wrong current AS950 version number. |
|  | 7118 | N | Issue is fixed in AS950 release version 0.03 where an exception used to occur when incorrect bottle distribution is configured. |
|  | 7184 | N | Issue fixed in AS950 release version 0.03 where earlier firmware was going to Hard fault when user starts debugging with USB cable plugged in. |
|  | 7039 | N | Issue fixed in AS950 release version 0.03. The system did not freeze anymore. |
|  | 7207 | N | Issue fixed in AS950 release version 0.03, application UI does not get stuck after a missed sample condition due to an error condition. |
|  | 7134 | Y | Issue fixed for Invalid alarm records are logged under alarms logs when its associated data log channel is erased or no longer available. |

## Improvements

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  | 7243 | Y | Changed Pacing menu options to   * Time Weighted * Flow Weighted * Time Table * Flow Table * Event   instead of   * Fixed Time * Fixed Flow * Variable Time * Variable Flow * Event |
|  |  | N | Changed Tubing diameter selections to “6.3mm (1/4 in.)” and “9.5mm (3/8 in.)” |
|  |  | N | Removed AUX-Pulse flow source from selection for Sample Volume – Variable type. |

## New Features

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
| 1 |  | N | Added support for IO9001. |
| 2 | 7244,  7131,  7212 | Y | CTVV |

# Version V0.03

The release date of this version is October 31, 2014.

## Defects

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  | 7203 | N | Updated min & max range restriction for Sample Program bottle quantity edit screen. |
|  | 7216 | N | Fixed the Sample Programming screen flow to skip disabled items during auto-advance. |
|  |  | N | Temporarily replaced the FPU coprocessor with software library to resolve floating pointing issues. |
|  | 7217,7165 | Y | Fixed defect preventing USB drive from being detected reliably when AS950 configured as IO9000 or AUX-mA. |
|  |  | N | Fixed an issue with Beeper being continuously turned ON during UI screen navigation. |
|  |  | N | Fixed defect preventing Sensor detection during system startup when program settings are modified before the sensor was identified. |
|  | 7231 | Y | Fixed the issue when user tries to access Export/Import menu with USB cable connected to PC. |
|  |  | N | Fixed defect in fuse protection of pump motor. On cross-over from soft start to 100% duty cycle the pump current filter was not being cleared, therefore the history of the soft start was being carried over and causing occasional pump faults. |
|  |  | N | Lowered UI FSM priority below Alarm FSM and higher than Idle FSM. We have been observing UI lock up scenario while configuring IO9000. The change was done to the hunch that the timing issue with UI FSM being higher priority than IO and Alarm FSM. |

## Improvements

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  | 7224 | Y | Updated USB Export/Import screen flow. |
|  |  | N | Updated time switch distribution algorithm to account for power failures and program halts, recovers with switch aligned to program start time. |
|  |  | N | Added support for the Rev 2 hardware revision of IO9004. Note: firmware is not backwards compatible with Rev 1. |
|  |  | Y | Improved initialization of first time switch based on program start:   1. Immediately on ‘Run’: Reference is equal to time of program start. 2. Delay:    1. None: Reference is equal to time of program start.    2. Date & Time: Reference is equal to the user defined program start time/date. Note: If in the past, the controller accounts for bottles missed based on first bottle position.    3. Time Duration: Reference is equal to the program start time plus the user time duration in minutes.    4. Flow Duration: Reference is equal to the time/date of when the user defined flow volume was acquired to satisfy the delay.    5. Slave Sequential: Reference is equal to the time/date of when the master program completed.    6. Slave Parallel: Reference is equal to the resume time of the master program. |

## New Features

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
| 1 | 7101, 6885 | Y | Added the ability to set the first bottle position when starting a multi-bottle sample program using time-switched distribution. |
| 2 |  | Y | Added multi-language support for UI (English, French, Spanish, Italian, German and Portuguese) |
| 3 |  | Y | Added a new event to record when a time switch it missed and the number of bottles that were advanced to correct alignment. This error can occur as a result of power loss or halted program. |
| 4 |  | Y | Added the ability to restore UI previous screen on wake-up. |

# Version V0.02

The release date of this version is October 16, 2014.

## Defects

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  | 7095 | Y | Fixed defect that was preventing the sample program from starting accurately after expiry of time/date delay. |
|  | 7193 | Y | Fixed defect in retaining global unit preference change after power cycle. |
|  | 7176 | N | Fixed defect in screen navigation from ‘Calibration – Volume – User Adjust’ screen; exiting from this screen using any of the hard keys was faulty. |
|  | 7150 | N | Fixed defect in handling min & max distance range in US900x Advance Settings menu. |
|  |  | N | Implemented temporary solution to solve pump faults that we believe is a result of floating point errors in the firmware. |
|  | 7123 | Y | Fixed USB Host Drive connect/disconnect issue. |
|  |  | Y | Fixed the issue with USB device not disconnecting after firmware download and before reboot. |
|  | 7125 | N | Modified behavior of user abort in bottles per sample. If the sample to any one bottle in the BPS set was aborted by the user, the AS950 will then abort all remaining samples within the set. |

## Improvements

|  |  |  |  |
| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
|  |  | N | Updated the instrument descriptor format to include body version of general settings, indicator for rain/RS485 option, and alarm status. |
|  |  | N | Added entries for additional languages in Messages.xlsm (language translation master file) |
|  |  | N | Updated USB Import screen flow with error message for ‘Root directory not found’. |
|  |  | N | Updated sensor connection status string under Status menu to show ‘Not Detected’, ‘Identifying’ and ‘Unidentified’ states. Removed the redundant menu screen flow ‘Hardware Setup – Connection Status’. |
|  |  | Y | Updated USB Export summary screen to show ‘Total Size’ value in KB, instead of MB. |
|  |  | Y | Disabled logging system alarm. System alarms can happen to frequently and store each and every log in to the log memory can corrupt flash memory too early. |
|  |  | Y | Modified AS950INF file format. Added instrument descriptor to AS950INF file. |
|  |  | Y | USB Drive root directory “AS950” is made hidden. |
|  |  | Y | Added USB Test mode code for USB 2.0 hardware compliance testing. |

## New Features

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| --- | --- | --- | --- |
| Item # | Track | Ext. (Y/N) | Description |
| 1 |  | Y | Implemented rain gauge and rate of change alarm. |
| 2 | 7111 | Y | Implement ‘Take first sample”, either immediately or after first interval. One caveat, if take first = immediate and scheduling is enabled; the first sample will be taken immediately on subsequent entries into a new schedule interval. |
| 3 |  | N | Implemented sorting for directory & file list menu under USB Import screen flow. |
| 4 |  | N | Extended user confirmation window (TConfimationWin) to make particular line bold text. |

# Version V0.01 (current)

The release date of this version is October 1, 2014.