Firmware Release Summary: Daniel 3804 Series Liquid Ultrasonic Flow Meters

VERSION 1.83

- Minor enhacements include:
  - Reduced occurrences of timeouts while writing meter configuration via DB API.

VERSION 1.79

- Corrected issue where Analog Output 2 ceases updating when placed in test mode and returned to normal operation mode

VERSION 1.78

- Fixed an issue where an excessive number of log entries were being generated which caused 3804 meter memory to prematurely reach full capacity. Highlights of this fix include:
  - Meter memory usage is now monitored and an alarm is generated if usage reaches a user configurable limit. This 'early warning' alarm ensures logs can be collected and cleared before logging is halted due to a full memory bank.
  - Logging will stop if memory usage hits a predefined set point. This safeguard ensures the meter will continue to measure event if logging must be halted.
  - Users can now force the meter to empty all log files while keeping the meter configuration intact. A restart is required to clear all log files. (Note: Daniel MeterLink™ Software v1.21 or later is required to perform this operation.)
- Transducer Health Monitoring, released in v1.76, has been modified to reduce the number of transducer maintenance required alarms that are generated and to prevent transducers from failing prematurely.

VERSION 1.76

- Enhanced chord substitution feature to improve accuracy of measurement calculated during a chord failure.
- Added transducer health monitoring. Firmware monitors gains and signal-to-noise (SNR) ratios to help identify a transducer with degraded performance.
- Improved signal detection algorithm to prevent acquiring a reflected signal.

- Symptom of a reflected signal is when the chord is reading a higher than expected gain and the speed of sound measured is about one third of the expected value.
- Additional minor enhancement:
    - Fixed timer problem in FPGA device driver.

VERSION 1.75

- Added support for Model 3802 2-Path Liquid Ultrasonic Flow Meter.
- Added support for 45°, 60° and 75° port angles.
- Other minor enhancements include:
    - Changed Daniel CUI references in warning messages to Daniel MeterLink.
    - Changed chord task to allocate same array size as BatchSize.

VERSION 1.73

- Added sanity check to batch time stamps to prevent frequency feedback from going to extreme states. Prevents meter from communicating half the expected frequency output rate and/or 1.5 times the maximum frequency output rate.
- Improved chord substitution by zeroing CurrPropUpdateBatches during total chord failure.
- Corrected the counting of Modbus TCP connections if these connections are rapidly closed to prevent a state where fewer than the specified 10 connections are allowed.
- A number of minor enhancements were introduced, including:
    - Allowed reading of Modbus register blocks with mixed data types.
    - Added support for Modbus registers in the 40001 range.
    - Added Modbus registers for SNRA1-SNRD2.
    - Corrected TimeLapse2, Modbus register 2302, units.
    - Accelerated identification of “Unsupported” Modbus registers.
    - Changed reserved and deprecated Modbus registers to read only access.
    - Removed SndVelCompErrLimit from DataQlty shadow register.
    - Corrected closing of Modbus TCP connections that created a memory leak, leaving pipes to the database open.
    - Changed Modbus TCP to ignore bad MBAP headers.
    - Changed extpd to ignore corrupted headers on port 10000.
    - Added piecewise linearization correction before wet cal correction.
    - Added support for 75° meters.
    - Removed RTCSecondsSinceEpochSet from audit log.
    - Added dependency check failure error to HART® command 167.
    - Changed latched alarms to retain state of alarms during a warm start.

- Changed noise energy from 16 bit to 32 bit to prevent attenuation at larger values.
- Changed writes to /nvdata/SysLogToText.txt to reasonably limit the file size.
- Prevented ‘super batch’ during chord failure and/or chord inactivity.

VERSION 1.70

- Added Modbus TCP.
- A number of minor enhancements were introduced, including:
  - Added latched alarms.
  - Removed expiring keys.
  - Added automatic generation of Ethernet and Log Access keys.
  - Changed Modbus registers for WtA, WtB, WtC, WtD, AO1IsFixed, AO1IsSaturated and SystemDelay to read only.
  - Corrected RS485 multidrop by parsing Modbus buffer to retain final message when multiple messages are received.
  - Improved Modbus mapfile handling to prevent serial communications timeout.
  - Modified Modbus protocol detection to respond only to expected strings and not to superfluous modem status such as “CONNECT” or “RING.”
  - Corrected PPP packet size and timeouts to allow connections at 1200 baud.
  - Corrected HART Commands:
    - Padded / truncated MeterSerialNumber for a fixed length.
    - Corrected bit order in bytes 10 and 13 of command 48.
  - Added support of drive cycles.
  - Corrected standard deviations of the transit times and delta times. The standard delta time deviation is ultimately used to compute turbulence.
  - Changed daily logs to report values for turbulence, profile factor, symmetry and cross-flow only when average flow is above the low velocity limit.
  - Eliminated numerous spurious alarms being set and cleared on a warm start.
  - Eliminated spurious system log messages when configuration is written.
  - Moved IsAvgSoundVelRangeErr from bit 31 to bit 29 of PrevDayMacro2.
  - Changed alarm severity levels.
  - Corrected backup upgrade.
  - Limited turbulence values to 100%.
  - Changed flow statistics to calculate continuously, even during low flow.
  - Changed reverse flow volume determination from QMeter to QFlow. Also, used flow vel to compare to ReverseFlowDetectionZeroCut rather than QMeter.

- Changed waveform export to only issue complete groupings of waveforms without sending additional waveforms from an unstable chord(s).
- Added time stamps to exported waveforms.
- Added computations for signal amplitude and SNR database points.
- Changed the average speed of sound to be determined from a straight average of the chordal speeds of sound.
- Corrected flow direction determination at low flow rates.
- Corrected dependency check for gain limits.

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