Product Supplement for FLOWCAL

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Introduction

FLOWCAL is an enterprise application used to consolidate, validate, correct, balance, and report gas and liquid measurement data. FLOWCAL is referred to as a Measurement System and consists of the Standard Functionality and related optional Add-Ons as mentioned below.

Software License Options and Metrics

This document defines the Standard Functionality and Add-Ons together with applicable license metrics that are available for Customer's access under mutually agreed FLOWCAL SaaS and/or Self-Hosted (where made available) Subscription Order(s). Such Order(s) shall specify the selected Add-On(s) and authorized license metric quantity.

Vendor may update or revise this Product Supplement from time to time. Updates will be made available within this document including the date of change as well as the changes made. New versions will be effective immediately upon addition to this document, except for any ongoing annual or committed Subscription Term, for which the previous version will apply until the end of such ongoing term, subject to the terms of the Agreement and Order. Customer should review the Product Supplement prior to using the Software to stay informed about the applicable license metrics. Capitalized terms are defined herein, in the Order, or the Agreement for the purchase of the Subscription(s).

Metric Definitions

- **Measurement Point:** the point where hydrocarbons and other products are measured, and the measurement affects the calculation, accumulation, and/or inventory of volume and mass. A measurement point can have many purposes, including but not limited to production volumes across one or more wells, inventory, custody transfer, allocations, etc. A measurement point in FLOWCAL is modeled by multiple objects and records: Meters, Tanks, Inventories, Liquid Caverns and standalone tickets. Therefore, the expected measurement point count is the sum of the active gas/liquid meters and existing tanks, inventories liquid caverns. Standalone tickets add to this at a rate of 100 tickets per month for one measurement point.
- **Field Desktop Application:** a software application for single user installations of field applications meant primarily for remote data collection. The Field Desktop Application is often integrated with a server counterpart providing a hub and spoke approach to managing field-related tasks for gas and liquid hydrocarbon measurement.
- **Licensed Operation:** a physical facility or infrastructure (ultimately as determined by Vendor in case of uncertainties) where there is a need to consolidate, validate, correct, balance, and/or report gas and liquid measurement data, and which is identified as (or as part of) the Licensed Operation in the Order.

Description of FLOWCAL Standard Functionality and Add-Ons

FLOWCAL Standard Functionality

The FLOWCAL Standard Functionality is the foundation of the FLOWCAL software and has applications across the entire hydrocarbon value chain that includes Exploration and Production, Midstream, and Distribution segments. The features in the Standard Functionality focus on gas and liquid measurement and includes the following:

- **Auto Estimate**: functionality required to automatically estimate missing measurement data. These features enable an implementation that continuously and autonomously searches for missing data and calculates estimates based on user configurable techniques. These techniques include using averages of existing data, using other meter data, computing point-to-point values across a gap, and inserting fixed values. Estimated values can subsequently be replaced by actual measurement data when imported.
- **Additional Data Validations**: functionality with additional user-configurable validation routines that identify anomalies in measurement data that may indicate measurement errors. The Additional Data Validation features enable a collection of validation routines that perform an extensive range of data inspections:
  - **Frozen Value:** Detects flow data variables that have stopped changing over time, indicating potentially failed inputs.

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- **Single Run:** Detects unexpected or abrupt flow changes from one hour to the next or from one day to the next.
- **Multiple Run:** Detects unexpected or abrupt flow changes by comparing the flowing parameters across up to four meters. This validation can be used for multi-tube locations, comparisons between check and custody meters, and similar situations.
- **Expert Systems:** By applying statistical analysis, this validation detects potential flow pattern anomalies that deviate from a historical trend.
- **Final Form:** Extends the standard min/max value checking and Expert Systems analysis to hourly, daily, and monthly data resolutions.

- **Exception Resolver Linkages:** functionality for one-click navigation to access data sets that have exceptions. The Exception Resolver Linkages features enables hyperlinks in an Exception Resolver tool that will open the Volume Editor or other appropriate views to provide direct access to the data that FLOWCAL flagged as having anomalies (exceptions).
- **Scheduled Reporting:** functionality for scheduled report generation with options to print, email, and write to file. The Scheduled Reporting features facilitate automatic generation and transmittal of FLOWCAL reports. Individual reports or groups of reports can be scheduled for monthly, weekly, or daily execution. Output capabilities include a variety of output file formats, including HTML, PDF, and CSV. The features include a dashboard to monitor successful and failed report schedules to ensure that reporting obligations are met in an efficient and automated manner.
- **Monthly Close**: functionality to perform a month-end close of the measurement data. The Monthly Close features enables an accounting-like close of measurement data that can be scheduled or initiated manually. Once closed, subsequent edits to data are considered prior period adjustments (PPAs). By configuration, FLOWCAL can prevent or allow PPAs. PPAs can be immediately processed or be placed on hold and subject to managerial approval. A clear audit trail of originally closed volume and applied PPAs is maintained.
- **Master Characteristics**: functionality for comparison of field devices (electronic flow measurement (EFM)/meter) and FLOWCAL meter configuration data, settings for contractual limits for inspection frequency, and calibration correction thresholds. The Master Characteristics features validate meter setup to ensure that the field device is configured with the expected configuration and base conditions. The features also impose contractually agreed limits used in various processes throughout FLOWCAL, such as Calibration Adjustments.
- **Source Analysis**: functionality for consolidating gas and liquid samples. The Source Analysis features provide centralized storage for gas and liquid analysis samples (quality sources). Analysis information can originate from online chromatographs, EFM averages, or samples (spot or composite). Analysis data is fully validated upon import for min/max limits, radical changes, frozen values, variance between imported and calculated values, and statistical variances. The Source Analysis features enable hydrocarbon properties calculations from components (Heating Value, Density, Molar Mass, etc.). Quality sources can be associated with many gas and liquids meters or Locations to apply to liquids tickets. Sample analysis is automatically applied to meters and tickets, and volumes are recalculated anytime data changes on the Quality Source or the assigned meters or Locations.
- **Gas Day Projection**: functionality for estimation of the current day's total volume and energy that updates throughout the day depending on data import frequency. The Gas Day Projection features project the total gas volume and energy for a meter for the current gas day. Results are stored separately from measurement information to prevent inadvertent usage by downstream systems. (Gas data only)
- **Audit Package**: functionality for pre-defined processes for auditing of gas measurement data. The Audit Package features automatically determine if an audit of gas measurement data is needed and provide a process framework for performing and managing the measurement audit and potential adjustment requests. A Windows® service monitors user-defined "check" versus "sales" meter relationships and flags unacceptable differences. The features identify suspect volume and energy discrepancies based on user-defined parameters. The audit workflow generates all necessary third-party correspondence while tracking the

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current and historical status of each audit. The Audit Package provides the foundation for an effective measurement audit group/department. (Gas data only)

- **System Balancing:** functionality for determination of system gains and losses considering all measurement points. Balancing results are aggregated into segments, inventories, and balances. Locations are aggregations of one or more Measurement Points (meters or other locations). All locations are rolled up and balances can be viewed at hourly, daily, and monthly resolutions. Segments and balances utilize meter directions to calculate the net contribution of members; inventories maintain an aggregated total inventory of tanks, caverns, line packs, line fill, and other inventories. Unlimited nesting of Locations provides highly flexible configurations for balancing multiple levels of systems and parent systems. The System Balancing features also enables calculated meters, which are hypothetical meters calculated from a combination of physical meters. Calculated meters are useful for estimating volumes where no physical meter exists, such as calculating fuel usage as a fraction of throughput volume or estimating CO2 extraction across a plant.
- **Data Transfer:** functionality to exchange data between FLOWCAL Customers via the FcDataBoss application. FcDataBoss can export high-fidelity snapshots of FLOWCAL data that can then be sent to other FLOWCAL Customers who in turn import the data. Data Transfers will contain 100% of the measurement data found on the source database including exceptions and complete audit trail. This feature can also be used to merge two FLOWCAL databases together to handle mergers or acquisitions.
- **Historical Data Purging**: functionality to purge (delete) FLOWCAL historical measurement data – which is no longer required per business requirements – via the FcDataBoss application. Historical Data Purge bypasses all data state safety mechanisms found in FLOWCAL and provides the most efficient and expedient way to purge data that is no longer needed. Because historical purge will purge all data as specified by the user regardless of data state, it is meant to be used by FLOWCAL administrators to manage data retention requirements.
- **Data Archiving**: functionality to allow Customers database administrators to manage the database size by automatically moving data from a production database to an archive database per Customer-defined criteria. The Data Archiving features helps manage database growth and achieve a constant database size. Having a consistent database size helps with having a predictable duration of database maintenance operations, reducing FLOWCAL upgrade time frames, maintaining database performance, and improving database management flexibility.

FLOWCAL Add-Ons

Several Add-Ons for the FLOWCAL Software are available and they can be separately licensed on top of the FLOWCAL Standard Functionality. The FLOWCAL Standard Functionality is a prerequisite for being able to purchase any of the Add-Ons under this Product Supplement. If you are interested in purchasing the “it” Server Add-Ons as a standalone product without FLOWCAL Standard Functionality as a prerequisite, refer to your local Quorum representative and the Product Supplement for standalone Measurement Field Applications.

The following Add-Ons are currently available in FLOWCAL:

Measurement Application Add-Ons

- **Transaction Queue:** functionality for direct import data insert into FLOWCAL staging tables. The included online transaction processing features use a Windows® service to import data on a near real-time basis. Data can be fed to the Transaction Queue by a data collection system via a secure database connection. The Transaction Queue process features eliminate the need to create and manage electronic files; instead, original data is stored, secured, and maintained as database table data.
- **Validation Set Points:** functionality for validation set point calculations. The Validation Set Points features provides a tool for reviewing historical data of a meter or quality source and calculating validation set points based on this history. The User controls the amount of history reviewed, the set points calculated, and a degree of tolerance within the data.
- **Multi-System Extension:** functionality for the segregation of measurement points across one or more ”systems”. The Multi-Systems Extension features allow Users to create logical separation of business units

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according to Customer needs. Example of separate "systems" are different business units or separate physical hydrocarbon systems, such as:
  - Regulated vs unregulated business units
  - US vs Canadian assets
  - Etc.
- **Liquid Inventory:** functionality for liquid inventory capabilities for tanks, liquid caverns, and liquid line pack meters. The Liquid Inventory features enable data management, validation, balancing, and reporting of tanks, liquid caverns, and liquid line pack meters.
- **Batch Movement Reconciliation:** functionality for confirmation that pipeline scheduled batches align with actual or measured batches. Batch schedules are imported from pipeline scheduling systems and matched to measured batches. Incomplete schedules are identified, providing important feedback for meeting delivery commitments. Matching criteria include product, quantity, locale (origin, destination), movement start time and movement end time.
- **Live Oil Management:** functionality for theoretical calculations of flash gas and dead (stable) oil volumes from a high pressure (live) oil stream or Measurement Point. Having theoretical gas and dead oil volumes affords flexibility to forecast and balance the high-pressure hydrocarbon production against actual gas and dead oil sales at the central processing facility.

Measurement Field Applications Add-Ons/ "it" Server Add-ons

- **CALCit:** functionality for the User to perform spot calculations for gas volume, plate size, liquid correction factors, speed of sound, and more. CALCit assists in equipment sizing and validation of other systems with the ability to view, save, and print the results of multiple calculations based on different input values.
- **TESTit:** functionality for advanced progression of automation tools that manage gas and liquid meter inspection and calibration results, manage testing and sample schedules, and conduct field calculations for flow rate.

  TESTit is a prerequisite for the Add-Ons listed below:
  - **PROVEit:** is a comprehensive and integrated software package used to prove, track, and manage liquids meter performance data based on the American Petroleum Institute's (API's) Chapter 12.2. Its features include (i) a stand-alone or networked database which utilizes the latest API and Gas Processors Association (GPA) algorithms to calculate meter factors for liquid measurement, and (ii) **PYCit,** an additional functionality included with PROVEit for Users to conduct Density Meter Provings and save those results in a database for reporting and exchanging that data with other PYCit users and FLOWCAL.
  - **ANALYZEit:** functionality for comprehensive validations, calculations, and reporting of gas chromatograph analyses. Validations include min and max limits, radical changes of components and properties, and standard deviation from historic data. ANALYZEit features calculates analysis properties such as relative density, heating value, and liquefiable content (GPMs) at ideal and real conditions, and at configurable pressure bases. HCDP phase envelopes and liquid dropout warnings are also produced.

Infrastructure Enhancements

- **Secure Gateway:** functionality for Customers with hosted subscriptions to securely access FLOWCAL and Field Application databases via VPN. Customers can run third-party applications to query data from measurement databases as well as direct SCADA systems to send import data to FLOWCAL transaction processing tables.

General FLOWCAL Licensing Terms

The FLOWCAL Software is licensed separately for the Standard Functionality and each Add-On according to the licensing scheme described in the Agreement and the Order (including this Product Supplement). Unless otherwise agreed, a pre-requisite for licensing and implementing Add-Ons is that the FLOWCAL Standard Functionality is licensed and properly installed.

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Subject to the terms of the Order, a FLOWCAL Software Subscription entitles Customer to receive access to the Standard Functionality and selected FLOWCAL Add-On(s) identified in the Order for the term of the Order in connection with and for the benefit of the Licensed Operation(s) operated by Customer as defined in the Order. The Standard Functionality and Add-Ons are licensed under a scheme where the Measurement Points of the Customer's Licensed Operation(s) are used to determine the annual Subscription Fee.

The Standard Functionality, selected Add-On(s), Licensed Operation, and the applicable initial Measurement Points are identified in the Order together with any special terms agreed between the Parties.

Changes to Measurement Points
Renewal Terms: Prior to each renewal term, Vendor will review Customer's actual Measurement Points in the Software for the previous twelve (12) calendar months ("Actual Measurement Points") to determine the Fees for the next renewal term. If Customer's Actual Measurement Points on each day in such period are less than the licensed Measurement Points, the applicable annual price adjustment (in accordance with the terms of the Agreement and Order) will be applied for the renewal term. If Customer's Actual Measurement Points on any day exceeds the licensed Measurement Points, the applicable Fees for the renewal term shall be calculated based on the Actual Measurement Points using the Vendor's then-current pricing formula.

Exceeding Licensed Measurement Points: The Licensed Materials may be used to manage no more than the Measurement Points level specified in the Order. Customer will be charged for additional Measurement Points that exceeds the licensed quantity, at Vendor's then-current pricing in effect at the time the additional Measurement Points are added.

Increasing Measurement Points During a Subscription Term: Customer may increase the licensed Measurement Points during an ongoing Subscription Term upon request and subject to (i) payment of an increase in Subscription Fees, calculated at Vendor's then-current rates at the time of the increase and (ii) execution of an amendment to the Order and/or new Order confirming the increased Measurement Points level and agreed Fees. When increasing the licensed Measurement Points level during an ongoing Subscription Term, additional Subscription Fees will apply as of the date set forth in the applicable amendment to the Order and remain in effect through the remainder of the ongoing Subscription Term, and will be invoiced in full the month after setting the higher Measurement Points level. Thereafter, the applicable Subscription Fee(s) will be invoiced annually with the other Subscription Fees.

No Decreases to Measurement Points During a Subscription Term: Customer may not decrease the licensed Measurement Points during any ongoing Subscription Term.

Delivery of the Software: The Software Subscription(s) will be delivered to the Customer on or before the License start date specified in the Order. Delivery shall be deemed to occur upon the Software being made available to the Customer, including but not limited to the physical delivery of media, provision of a download link, provision of login credentials, the issuance of license keys or any other means by which the Software is made available to the Customer. If access to the Software includes access to Module(s) or Add-On(s) of the product suite for which Customer has not procured a Subscription, Customer is not entitled to extend the use of the Software to such additional Module(s) or Add-On(s) without procurement of additional Subscription(s). Any hardware and software needed for the Customer to access the Software shall be at the Customer's responsibility to acquire, install, and maintain.

An Order for the relevant Software Subscription must be in place before starting any design, configuration, and/or implementation activities in the Software.

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Change Log

Date of Change	Details of changes
November 21, 2023	Initial Release
September 24, 2024	Update to Measurement Point description
October 24, 2024	Delivery of Software Update

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