

The Electronic Flow Measurement (EFM) Server operates within the Universal Server architecture and provides comprehensive support for storage, management, and reporting. For applications requiring collection of gas or liquid measurement data, EFM archives (collected by individual devices in the Universal Server) are forwarded to the EFM Server for centralized storage and export to industry standard formats. This high performance architecture frees the Universal Server resources to continue data acquisition while the EFM server stores all received data in a Microsoft SQL Server database. Top-level features of the EFM Server include:

- May reside on the same computer as the Universal Server or may be installed on any other accessible node within the network.
- May use any available Microsoft SQL Server on the network.
- The Microsoft Data Engine (MDSE) may be installed for applications that do not already have SQL Server available.
- Validates each data item reported to the server to ensure that any subsequent unauthorized changes to the data are automatically detected.
- Multiple Universal Servers may employ a single EFM Server or the user may deploy multiple EFM Servers for the application.
- Provides automatic detection and backfill of missing history data.
- Provides automatic detection of unauthorized changes to stored data.
- Supports separate devices for gas quality data (chromatographs) that may be associated with any meter for reporting.
- Maintains separate data sets for normal (hourly) EFM data, daily averages, and fast trend data.
- Maintains separate data tables for station (quality) and meter configuration (snapshot) data, such as orifice sizes, pipe diameters, and other industry standard parameters.
- Maintains separate tables for meter events and alarms that are reported by devices.
- Includes standard parameter identifiers for virtually all quality and flow properties used for gas and liquid measurement.
- Provides user-defined properties and device-defined properties to allow storage and reporting of any parameter archived by a device and acquired by Universal Server devices.
- Fully compatible with clustered Universal Servers, EFM servers, and SQL databases for fault-tolerant applications.

Data Export and Reporting

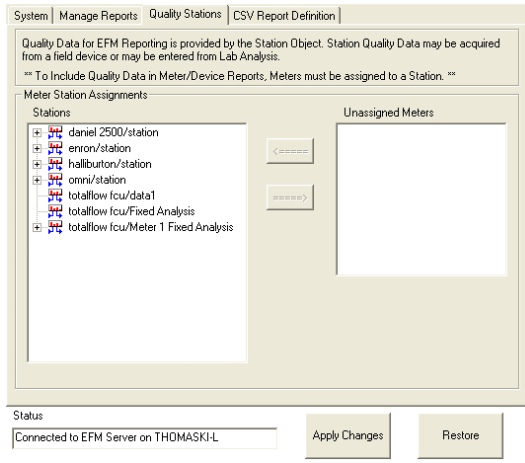
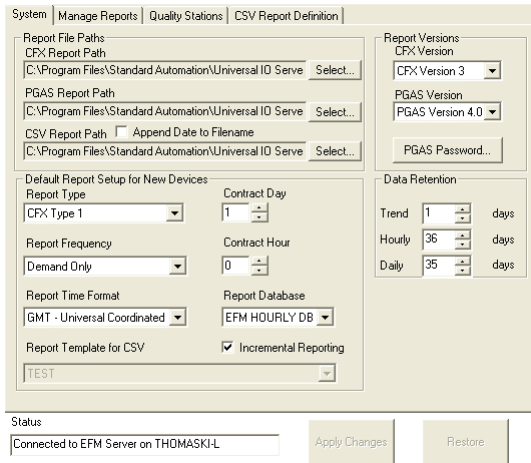
All data maintained by the EFM Server may be automatically exported to leading industry formats for use by gas measurement systems. Reports may be scheduled to occur on an hourly, daily, or monthly basis, immediately upon collection of device data, or upon demand only. Reporting features of the EFM Server include:

- Supports export to Flow-Cal format (CFX) Versions 3 and 4, Report Types 1 through 4.
- Supports export to PGAS Versions 4.0 and 4.2 formats with optional file encryption.
- Full support for user-defined comma delimited (CSV) format for import into Excel or any gas measurement system.
- Any combination of reports, both standard and user-defined CSV, may be scheduled for each device in the system.
- Where appropriate, reports may include all device meters in a single file or separate report files may be generated for each meter.
- Interactive CSV report definition tools allow the user to designate the contents and order of columns in each report section. Reports may optionally include CSV headers in the first line of each section.
- CSV reports may include up to five sections for each report that are exported to separate files. Available sections include volume, quality, configuration (snapshot) data, events and alarms.

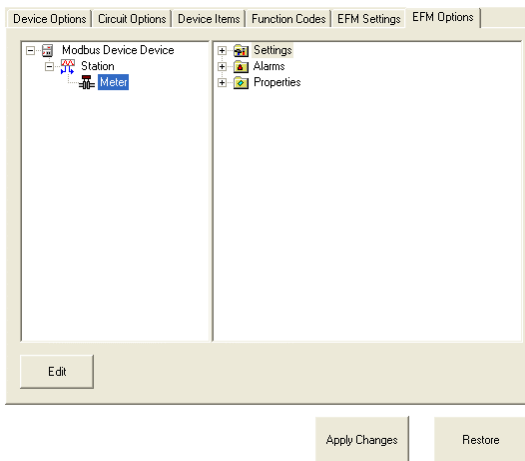
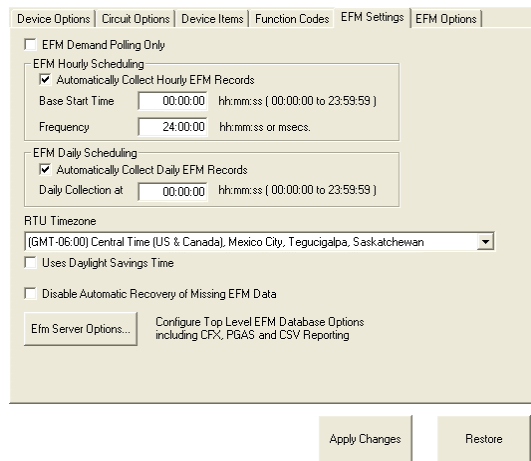
- Optional device-level CSV reports for non-EFM data may be archived and forwarded from any device.
- Separate user-defined directory paths for CFX, PGAS and CSV Reports.
- User-defined limits for data retention in hourly, daily, and trend databases to restrict database sizes.

Universal Server/EFM Server Features

The **System** tab (below left) on the Universal Server EFM Configuration displays system-wide repository settings, such as the number of days to retain data in EFM History databases. The **Quality Stations** tab (below right) on the Universal Server EFM Configuration allows you to combine meter and station information from different devices.



The **EFM Settings** tab (below left) on the Universal Server Device Configuration allows the user to set the time and interval in which EFM data is received and stored. The **EFM Options** tab (below right) on the Universal Server Device Configuration allows the user to define the station and meter parameters for EFM collection.



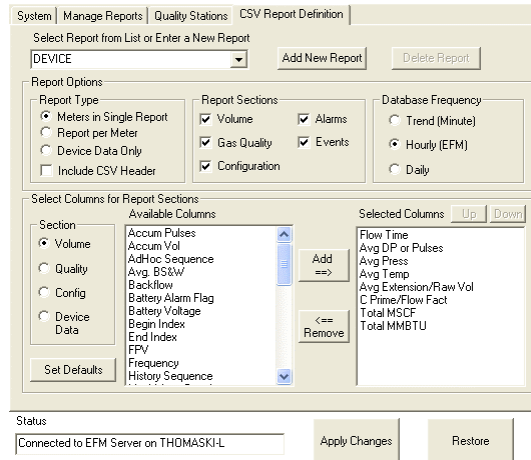
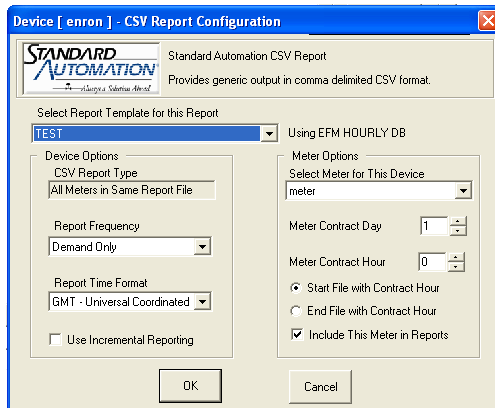
CSV Reporting

The **CSV Report Configuration** screen (below left) allows the user to set the parameters for generating a CSV report.

- If the report is to be automated, a contract day and hour are collected.
- The report may be output with GMT, Local Server Time, or Device time.
- Different templates can be scheduled for the same device.
- Device-level and Meter-level reports can be generated.
- Options are available for scheduled report frequency (demand only, hourly, daily, monthly, as collected).

The **CSV Report Definition** tab (below right) allows the user to define and store CSV report templates.

- Define a new report or select an existing report for editing.
- When a field is selected from the Available Columns list, it can be added to the Selected Columns list, where the parameters may be arranged as they will appear in the report.



Flow-Cal

The Universal Server supports export of EFM data to the Flow-Cal System, CFX Types 1-4, Versions 3 and 4.



www.flowcal.com

The Flow-Cal System provides measurement and analytical services throughout the United States and abroad. Customers include oil and gas producers, gatherers, processors, pipelines, refineries, and petrochemical companies. Flow-Cal is the global leader in software development for measurement data management.

The Flow-Cal System is a comprehensive and integrated software package that is designed to manage electronic gas measurement (EGM) data from the field meter to the corporate accounting system. The program originates with an automated import utility that incorporates elaborate expert system (ES) routines that can quickly identify suspect data for the measurement analyst. Once identified, several editing techniques are available to quickly and accurately correct the problem. Any changes are automatically logged while preserving a complete audit trail that not only meets, but actually exceeds the American Petroleum Institute's (API) Chapter 21 and the American Gas Association's (AGA) recommended standards.

The reporting module contains an extensive selection of standard reports, including configuration options for format modification. With the use of the scheduler, reports can be automatically printed by the Windows print manager and sent via e-mail, posted to a website, or faxed. Ad hoc query and custom reports are always available because the Flow-Cal System utilizes the Oracle database, the most prolific large-scale database in the world. Oracle's open database architecture provides for easy export to a downstream program, spreadsheet, or another database.

CFX Reporting

The **Flow-Cal CFX Report Configuration** screen (below) on the Universal Server EFM Configuration allows the user to set parameters for generating a CFX report.

A screenshot of the 'Flow-Cal CFX Report Configuration' dialog box. The window title is 'Device [enron] - Flow-Cal Cfx Report Configuration'. The dialog is divided into two main sections: 'Device Options' and 'Meter Options'. Under 'Device Options', there are dropdown menus for 'Report Frequency' (set to 'Demand Only'), 'CFX Report Type' (set to 'Type 1'), and 'Report Time Format' (set to 'GMT - Universal Coordinated'). There is also a dropdown for 'Report Database' (set to 'EFM HOURLY DB') and a checkbox for 'Use Incremental Reporting' which is unchecked. Under 'Meter Options', there is a dropdown for 'Select Meter for This Device' (set to 'meter'), two spinners for 'Meter Contract Day' (set to 1) and 'Meter Contract Hour' (set to 0), and two radio buttons: 'Start File with Contract Hour' (selected) and 'End File with Contract Hour'. There is also a checked checkbox for 'Include This Meter in Reports'. At the bottom of the dialog are 'OK' and 'Cancel' buttons.

- Options are available for report type selection (Version 3: Type 1 - Type 3; Version 4: Type 1 - Type 4) and scheduled report frequency (demand only, hourly, daily, monthly, as collected).
- The report may be output with GMT, Local Server Time, or Device Time.

PGAS

The Universal Server supports export of EFM data to PGAS Versions 4.0 and 4.2 (with optional encryption).



www.pgas.com

PGAS offers a complete gas measurement system designed and developed on an open systems platform. Main features include flow computer data processing, exception editing, chart integration, gas calculation, physical gas balancing, validation, reporting, and meter test inspection.

Special features include gas analysis and calculations (based on AGA standards), data maintained by individual meters and stations, user-configurable features, fully featured views and reports, physical gas balancing, EFM flow data editing, and reliable historical data storage with complete audit trail. These convenient query tools allow PGAS users to accurately view and report measurement information.

PGAS Reporting

The **PGAS Report Configuration** screen (below) on the Universal Server EFM Configuration allows the user to set parameters for generating a PGAS report.

A screenshot of a software dialog box titled "Device [enron] - PGAS Report Configuration". The dialog box has a blue title bar and a light beige background. At the top left is the PGAS logo. To its right, it says "PGAS File Export" and "PGAS is a registered trademark of PGAS Inc, Houston, Texas". The dialog is divided into two main sections: "Device Options" and "Meter Options". Under "Device Options", there are three dropdown menus: "Report Frequency" (set to "Demand Only"), "Report Time Format" (set to "GMT - Universal Coordinated"), and "Report Database" (set to "EFM HOURLY DB"). There is also a checkbox for "Use Incremental Reporting" which is unchecked. Under "Meter Options", there is a dropdown menu for "Select Meter for This Device" (set to "meter"), two spinners for "Meter Contract Day" (set to 1) and "Meter Contract Hour" (set to 0), and two radio buttons: "Start File with Contract Hour" (selected) and "End File with Contract Hour" (unchecked). There is also a checked checkbox for "Include This Meter in Reports". At the bottom of the dialog are "OK" and "Cancel" buttons.

- Options are available for output type selection (per meter or per device) and scheduled report frequency (demand only, hourly, daily, monthly, as collected).
- The report may be output with GMT, Local Server Time, or Device Time.



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