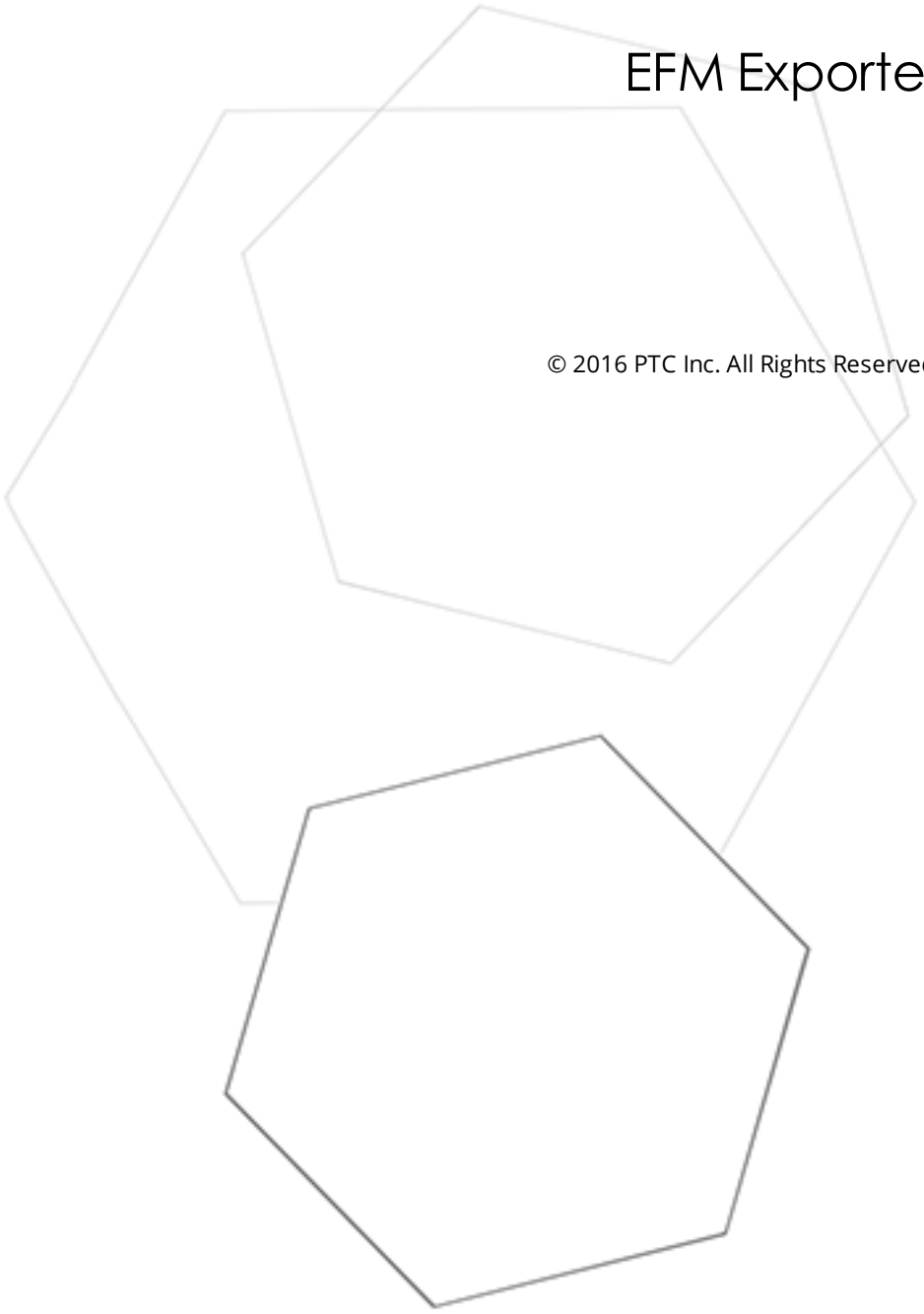
EFM Exporter



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Help version 1.098

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Overview

In pipeline management of the oil & gas industry, it is necessary to collect both real-time and historical flow measurement data. Real-time data is used for monitoring well-site tank levels or equipment at compressor stations, and may also be used for controlling valves, pumps, and so forth. The historical flow data (sometimes referred to as "the audit trail") is used for allocations and custody transfer, which is a term used by the oil & gas industry for managing invoices and payments when one company's pipeline feeds into another company's pipeline. The data can also be used by operations to monitor performance. Because it is used for billing purposes, this data is extremely sensitive and needs to be accurate, reliable, and auditable.

Historical flow data is often referred to as Electronic Flow Measurement (EFM). The data consists of hourly and daily flow averages calculated by flow computers reading raw data from one or more flow meters. It also consists of configuration data, alarms, and events. The hourly and daily averages are calculated and stored because it often is not possible to access real-time flow values due to remote geographic locations and the number of flow computers. Furthermore; radio, cellular, and satellite communications are frequently needed to reach these devices. Due to the low bandwidth of these networks and the large number of devices with which a company might be communicating, it is necessary to schedule specific times to communicate with the devices.

The EFM Exporter manages the scheduled polling and exporting of EFM data from flow computers. Customers can group meters under specific poll schedules, and upload data into flow measurement and accounting solutions (like Flow-Cal and PGAS) as well as to user-defined CSV and database formats. Furthermore, the EFM Exporter uses consistent appearance and navigation for oil & gas companies that manage both liquid and gas products.

Supported Export Formats

- Flow-Cal V5 (CFX)
- Flow-Cal Transaction Queue
- CSV
- Database
- PGAS V8

Licensing the EFM Exporter

Licensing the EFM Exporter

The EFM Exporter uses a tiered, device-count-based licensing model. A license can be purchased that enables the product to run for an unlimited amount of time for a fixed maximum number of unique EFM devices. The license limit does not prevent the addition of new EFM devices beyond the allowed EFM device count, nor does it signal the product to enter Demo Mode; it prevents EFM data uploads beyond the allowed license count.

The licensed and configured EFM device counts are reported in the Event Log on server startup, when the runtime server re-initializes, or when a unique EFM device is added or removed in the configuration that exceeds the EFM device limit allowed by the license. A unique device is defined as one instanced of the channel-device combination. Any number of meters may be added to a device without consuming an additional device license.

Below is an example startup server informational Event Log message indicating a 1000 EFM Device license installed with 789 unique EFM devices configured in the project:

"License Type: Counted, License Limit: 1000, Devices: 789 licensed, 0 unlicensed."

Below is an example Event Log warning message when a license is exceeded. In this example, there is a 1000 EFM device license installed and 1007 unique EFM devices in the project:

"The licensed device count of 1000 has been exceeded by 7 device(s)."

If the license limit is exceeded, existing unique EFM device references can be removed to return within the limits of the license or to allow new unique EFM devices to be added and utilized. When the EFM device count is back under the license limit, an Event Log message is no longer posted to indicate the product has exceeded the limits.

Note: When the license limit is exceeded, the EFM Exporter processes the licensed number of unique EFM devices configured; the devices considered licensed can vary based on the order they are loaded in the server during startup.

Unlicensed Operation

When no license is installed, the product enters Demo Mode, which allows a time-based limit that stops working when the demonstration period expires.

EFM Drivers

The EFM Exporter only works with EFM drivers, which are drivers that expose meters and usually contain some level of EFM-specific configuration. EFM drivers share several functions that affect the EFM Exporter.

Interleaving

EFM drivers are responsible for interleaving real-time data (tag) requests and EFM polls. This allows real-time tag updates to continue for a channel while EFM data is being polled for a device.
Note: While interleaving, the priority in order of highest to lowest is as follows: writes, reads, and exception-based reads. EFM polls are considered reads.

New EFM Data

EFM drivers are responsible for caching the latest EFM data that has been gathered from the device to ensure that each poll only requests new EFM data. For example, after startup, the first poll requests all the History data in the device. The next poll only retrieves the new History data recorded after the first poll.

Cached EFM Data

All EFM drivers clear their cached state when a new project is loaded. Once cleared, the first poll requests all the data in the device. All other scenarios that cause the cached state to clear are driver-specific. For more information, refer to the specific driver's help file.
Note: Drivers can also clear the cache through the user interface. For more information, refer to the specific driver's help file.

Shared EFM Data

Some devices have shared data. For example, a device may have one Alarm archive for all meters. The driver is responsible for ensuring that the Shared EFM data is only read once per poll, even if multiple meters are defined that rely on the same shared data.

Missing EFM Data

If EFM data is missed because of a communications error, the driver continues to cache the latest good data that is retrieved from the device. When communications return, the EFM Exporter re-polls the device at the scheduled poll interval and the driver queries for new data (which includes the missing data). Client applications can trigger a poll to speed this process.

Time Zone

Users are responsible for understanding the physical device's time zone and Daylight Saving Time capabilities. Configuring the EFM-compatible driver's time zone and Daylight Saving Time to match the physical device ensures that record times are accurately converted by the exporters that perform that function.

EFM Pointer Files

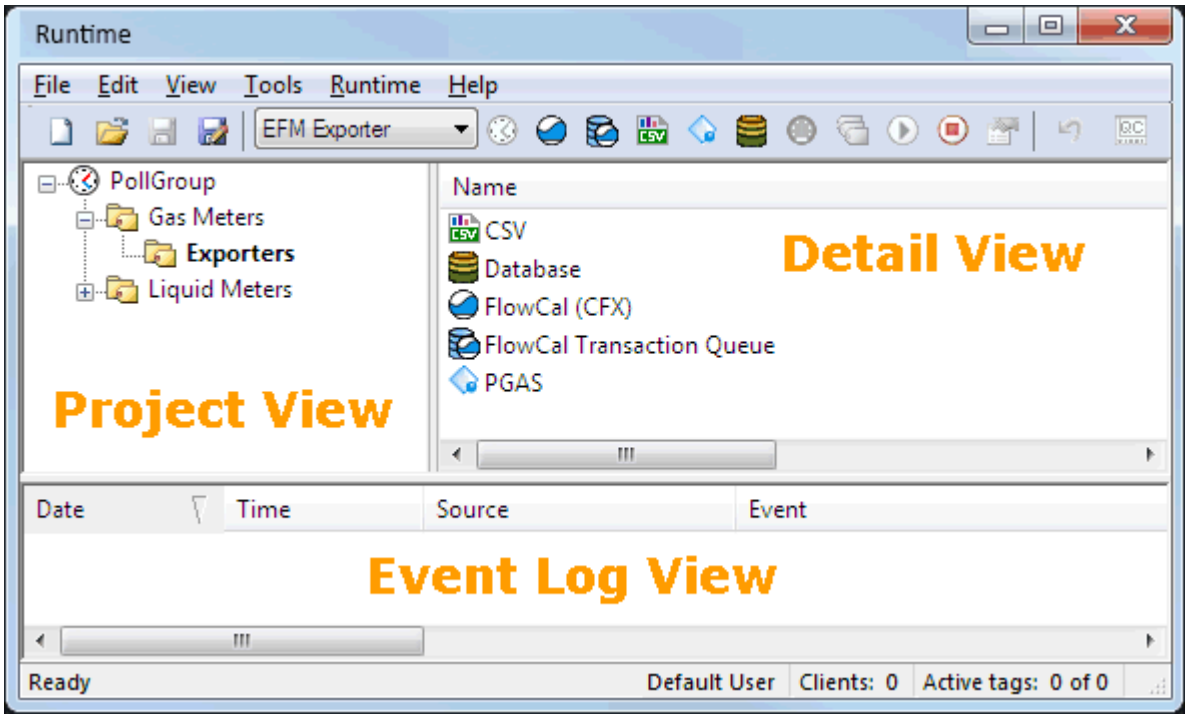
EFM pointer files are used by EFM drivers to persist flow computer EFM archive positions across server restarts. Preserving this state information allows EFM drivers to minimize the amount of data uploaded from a flow computer after the server restarts. The pointer files are maintained in the server's application data directory, which is a directory that is configured when the server is installed. The server maintains these pointer files across server restarts, upgrades, and uninstallations, except when the **Remove user data. The current Runtime project and custom server settings are removed.** option is selected when uninstalling.

The server can be forced to upload all available EFM data from a flow computer by performing a "Clear Cache" on the device associated with the desired meters. For instructions on clearing the cache, refer to the specific driver's help file.

Note: EFM drivers expose system tags that allow clients to control a device's EFM pointer file and cache. For more information, refer to the **System Tags**.

User Interface

The EFM Exporter interface is divided into three panes: the Project View, the Detail View, and the Event Log View.



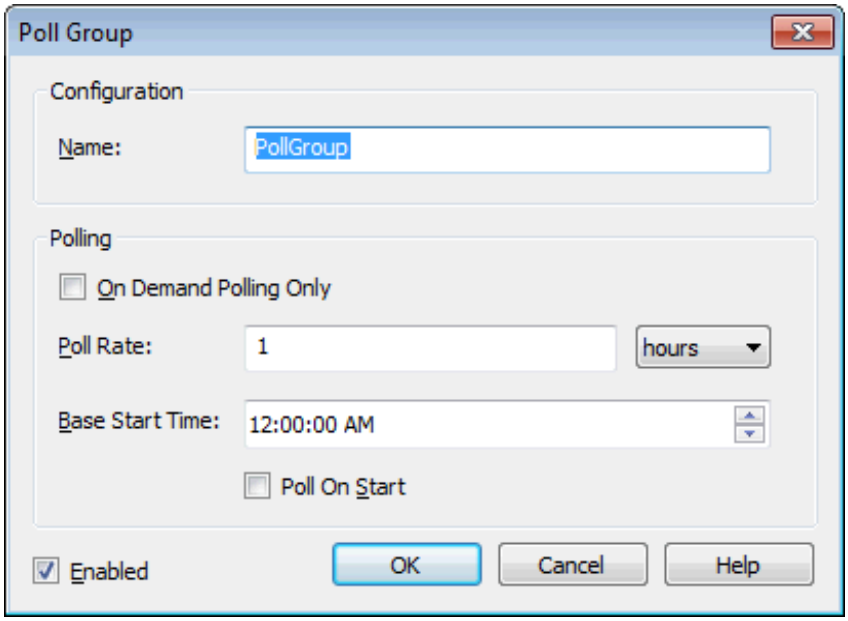
Descriptions of the views are as follows:

- **Project View:** This view displays poll groups, which control when EFM data is collected. Each poll group contains a folder for gas meters and liquid meters, which in turn contain a folder for exporters. Meters represent a meter that is attached to a device or flow computer. There may be multiple meters for one device. Exporters represent the output formats that are supported by the plug-in. The poll group polls child meters for EFM data and then passes that data to the exporters (which are the output formats supported by the EFM Exporter). For more information, refer to **Poll Group**, **Meter**, and **Exporters**.
- **Detail View:** This view depends on the folder that is selected in the Project View. When the gas meters or liquid meters folder is selected, the Detail View displays the meters that are assigned to the poll group. When the exporters folder is selected, the Detail View displays the exporters that are utilized in the poll group. For more information, refer to **Meter**.
- **Event Log View:** This view displays error, warning, and information messages for the plug-in and the server. The source of EFM Exporter events is "EFM Exporter".

Poll Group

The poll group controls when EFM data is collected from the child meters and exported through the child exporters.

Note: EFM data is not stored in an intermediate database: it comes directly from the meter and goes directly to the exporter.



Descriptions of the parameters are as follows:

- **Name:** This parameter specifies a unique name for the poll group. The default setting is "PollGroup".
- **On Demand Polling Only:** When checked, this option specifies that polling only occurs on writes to the poll group's poll tag. The server does not schedule polls. The default setting is unchecked.
  Note: The poll group's poll tag is available through OPC and other client interfaces that are supported by the server. This allows SCADA systems to control polling.
- **Poll Rate:** This parameter specifies the amount of time between EFM data polls, and may be set in terms of Minutes, Hours, or Days. The valid range is 1 minute to 90 days. The default setting is 1 hour.
  Note: On Demand polls and polls on Start does not affect scheduled polls.
- **Base Start Time:** This parameter specifies the base 24-hour time at which polling starts. The default setting is 12:00 AM.
  Notes:
  1. If the poll rate is greater than 24 hours, this time represents the time of day to start the first poll. For example, if the Base Start Time is set to 10:01:00 AM, the poll rate is 24 hours, and it is currently 1:10:00 PM; the first poll occurs the next day at 10:01:00 AM. If the poll rate is less than 24 hours, polling begins at the next available interval (as if it started at the Base Start Time). For example, if the Base Start Time is 10:01:00 AM, the poll rate is 1 hour, and it is currently 1:10:00 PM; the first poll occurs at 2:01:00 PM.
  2. Base Start Time does not adjust for Daylight Saving Time. If polls need to correspond with Daylight Saving Time, a restart is required after a Daylight Saving Time transition to synchronize to the adjusted time.
- **Poll On Start:** When checked, this option starts a poll as soon as the EFM Exporter is started. This occurs when the server is restarted, stopped/started, when a new project is loaded, or when the EFM Exporter is edited. The default setting is unchecked.
- **Enabled:** When checked, this option enables polling in the EFM Exporter. When unchecked, the EFM Exporter does not poll. The default setting is checked.

Failed Polls

Polls can fail under the following conditions:

- When the device experiences a failure in communications, which prompts a meter to return bad quality data.
- When the serial device is configured with an invalid COM port, or has specified a connection type of None.

In both failure scenarios, the poll group continues to gather the EFM data that is available. It fails to export any EFM data that could not be gathered and displays an error message in the Event Log in consequence. The EFM data successfully gathered is exported.

Meter

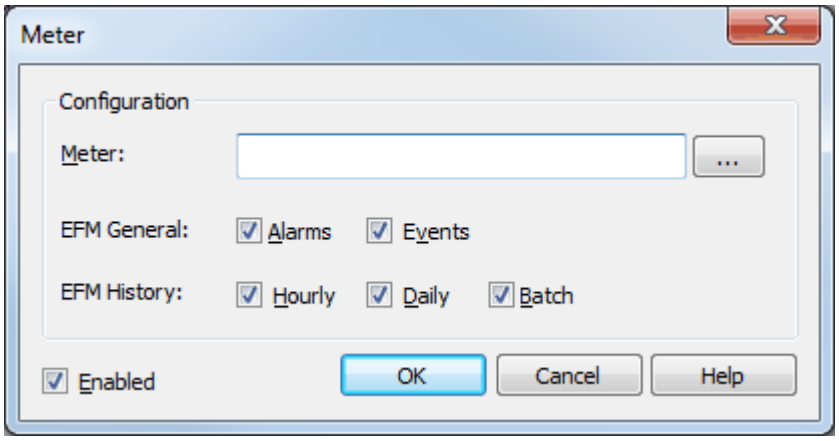
Each EFM Device has one or more gas or liquid meter(s) that may contain optional EFM data. When polling, EFM data is gathered for each meter in the following order:

- Configuration
- Liquid Product
- History (Hourly, Daily, and Batch)
- Alarms
- Events

Notes:

1. Batch and Liquid Product meter data is only available to liquid meters.
2. A gas meter poll only collects new History, Alarms, and Events data for a gas meter. A liquid meter poll only collects new History, Alarms, Events, and Batch data for a liquid meter. These types of EFM data are optional.

Important: The device configuration controls the data that is gathered as well as how the data is mapped to EFM. For more information, refer to the specific driver's help file.



Descriptions of the parameters are as follows:

- **Meter:** This parameter specifies the meter name. When browsing, the meter name is automatically generated using the format <*Channel*>.<*Device*>.<*MeterName*>, where <*Channel*> and <*Device*> are created and named in the server's Channels/Devices Project View, and the <*MeterName*> is set in the <*Device*> configuration. For example, "EFM Simulator.Device1.GasMeter1".
  Note: To browse the server configuration for meters, click the browse icon. For more information, refer to **Meter Browser**.

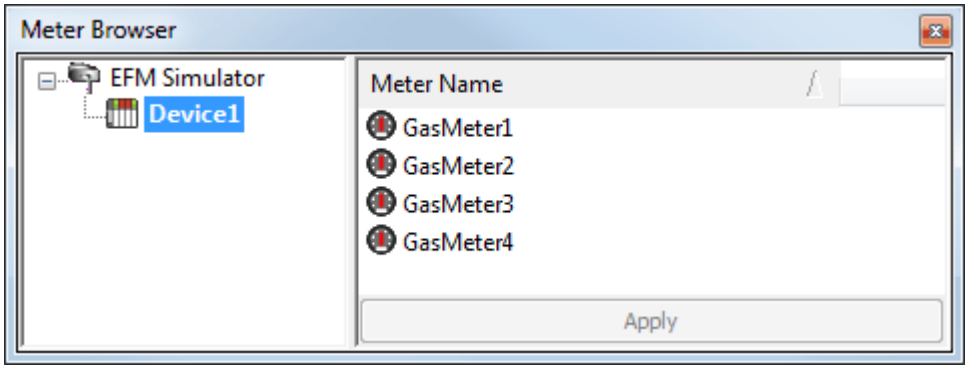
- **EFM General:** This parameter specifies the type of data that the EFM Exporter reads for the meter. Options include Alarms and Events. All options are checked by default when applicable. Descriptions of the options are as follows:

    - **Alarms:** When checked, meter Alarms are uploaded. The device configuration defines what constitutes a meter Alarm.
    - **Events:** When checked, meter Events are uploaded. The device configuration defines what constitutes a meter Event.
- **EFM History:** This parameter specifies the history data to be collected for the meter. Options include hourly and daily. All options are checked by default when applicable. Descriptions of the options are as follows:

    - **Hourly:** When checked, hourly meter data is collected. The device configuration controls the EFM data in an hourly record.
    - **Daily:** When checked, daily meter data is collected. The device configuration controls the EFM data in a daily record.
    - **Batch:** When checked, batch meter data is collected. The device configuration controls the EFM data in a batch record. This option is only available for liquid meters.
- **Enabled:** When checked, this option enables data export in the meter. When unchecked, the EFM Exporter does not pull any data from the meter. The default setting is checked.

Meter Browser

Only EFM-enabled devices of the specific meter type are displayed. For example, when adding a new meter to the gas meters folder, users are only able to browse for available gas EFM meters. liquid EFM meters are not displayed.



Best Practices

It is not recommended that users include a device under multiple poll groups. The server caches EFM data (like last poll time) for each device. If a device is in more than one poll group, this can result in inconsistent data being exported by each poll based on poll timing. For example, data collected for a device by the first poll group is not re-collected by the next poll group.

Exporters

Exporters take the data that was collected from each meter during a poll and then export it to a given format. Exporters ignore meter data that they are not configured to export. If an exporter requires meter data that is not available, it outputs an Event Log message. An exporter's configuration and behavior is unique, and depends on the exporter type. For more information on a specific exporter, select a link from the list below.

Flow-Cal Exporter (CFX)
Flow-Cal Transaction Queue Exporter
CSV Exporter
Database Exporter
PGAS Exporter

Note: The "Toggle On/Off" icon located in the EFM Exporter toolbar provides access to quick enabling or disabling. When a parent folder (such as "PollGroup") is toggled off, all child folders beneath it are also be disabled. Furthermore, when the poll group or meters folders are toggled off, users cannot enable an exporter.

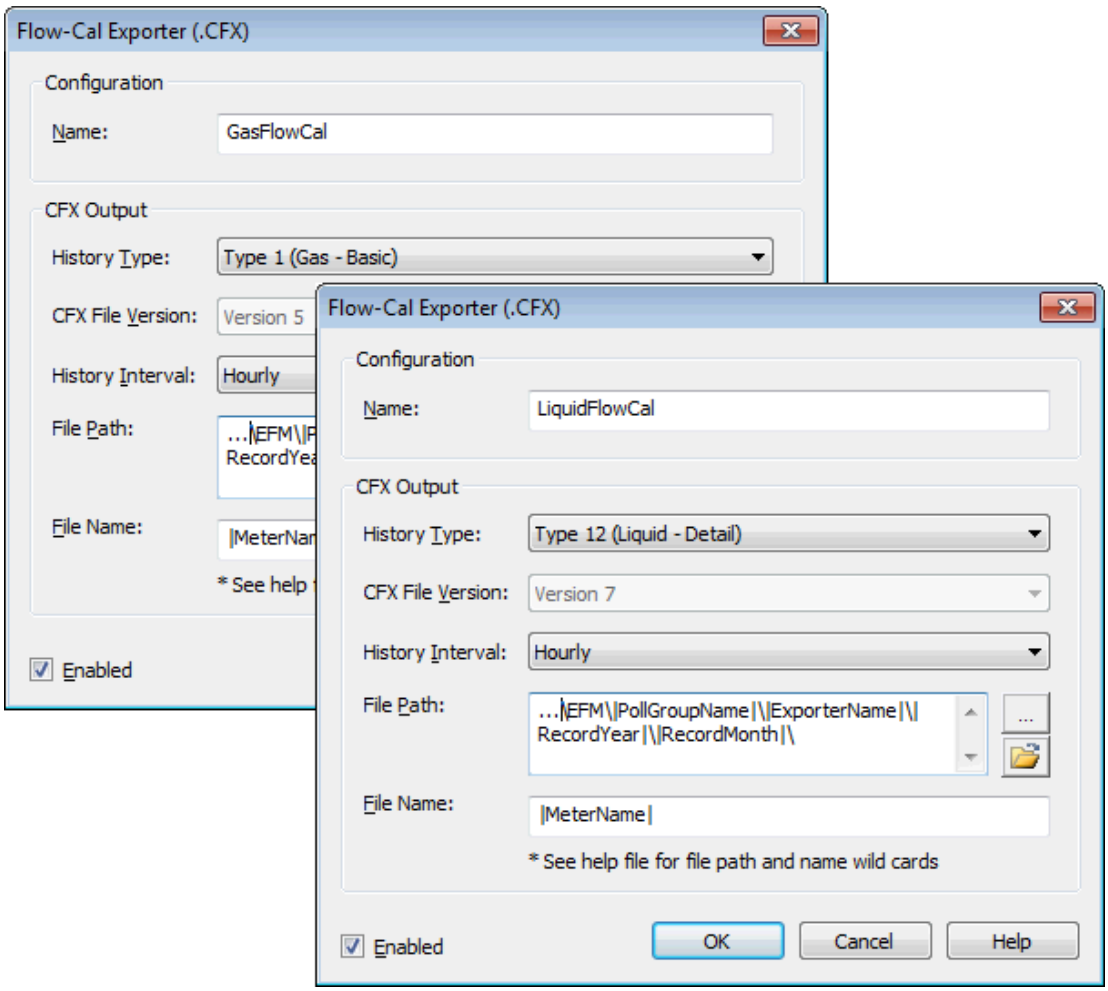
Clearing the Cache

The Flow-Cal Exporter keeps a local cache of the EFM data that was collected for each meter, allowing new data to be appended as it is collected. The cache grows until the exported data is consumed.

Flow-Cal Exporter (CFX)

The Flow-Cal Exporter exports gas EFM meter data to V5 CFX files and liquid EFM meter data to V7 CFX files. Whether a new file is created per poll or data appended to an existing file depends on the configuration of the file path and file name parameters. The Flow-Cal Exporter keeps a cache per meter, allowing it to append data to an existing file. The cache is cleared when the client application deletes the exported file.

Note: Times written to the CFX file use the local device time zone.



Descriptions of the parameters are as follows:

- **Name:** This parameter specifies a unique name for the exporter. Each exporter must have a unique name that can neither start with an underscore nor contain a period. The maximum length is 1024 characters. The default setting is "GasFlowCal" for gas and "LiquidFlowCal" for liquid.
- **History Type:** This parameter specifies the type of history records to be exported. Different options are presented based on the type of meter being configured. Flow-Cal history records for Gas data include Type 1 (Gas - Basic), Type 2 (Gas - NX19/G1/G2), Type 3 (Gas - Analysis), and Type 4 (Gas - Exotic). The default setting is Type 1 (Gas - Basic). Flow-Cal history records for Liquid data include Type 11 (Liquid - Basic), Type 12 (Liquid - Detail), and Type 13 (Liquid - Analysis). The default setting is Type 12 (Liquid - Detail). Descriptions of the options are as follows:

- **Type 1 (Gas - Basic):** This type contains basic flow information for meters without online chromatographs (such as gas volume percentages).
- **Type 2 (Gas - NX19/G1/G2):** This type contains data for NX19, Gross 1, and Gross 2 calculation methods (which are AGA and industry standard methods for calculating flow).
- **Type 3 (Gas - Analysis):** This type contains data for analysis values using AGA8-Detail calculations.
- **Type 4 (Gas - Exotic):** This type contains exotic analysis values that are not typically used or available.
- **Type 11 (Liquid - Basic):** This type includes basic liquid flow information without composition data.
- **Type 12 (Liquid - Detail):** This type includes detailed liquid flow information that is required for most standards.
- **Type 13 (Liquid - Analysis):** This type includes detailed liquid flow and analysis information.

Note: If Type 3 (Gas - Analysis) information is available from the device, but Type 1 (Gas - Basic) is selected, the additional Type 3 (Gas - Analysis) data is filtered out.

- **CFX File Version:** This parameter specifies the CFX file version to be used when exporting data. For Gas data, this parameter is fixed to Version 5. For Liquid data, this parameter is fixed to Version 7.
- **History Interval:** This parameter specifies what data set is exported from the device. The Flow-Cal Exporter supports the export of one history data set from the device per CFX file. Options include hourly and daily. The default setting is hourly.
  Note: If a meter does not supply daily data but daily is selected, the meter's Daily History data is not included in the CFX file. The same situation applies to hourly data. To export both daily and hourly data, create two Flow-Cal exporters.
- **File Path:** This parameter specifies where the .CFX file is placed. Although the directory can be a UNC network path or a local path, the server Runtime must have write access to it. Network drives are not supported when the server is in Service Mode. A directory is created if one does not already exist. The default setting is the user's My Documents directory. To browse for and select a new file location, click the **Browse** icon. To open the file path without wildcards, click the **Open** icon.
- **File Name:** This parameter specifies the name of the file. It does not require a .CFX extension, and supports wildcards. For more information, refer to "Wildcards" below. The default setting is |MeterName|.
- **Enabled:** When checked, this option enables polling in the exporter. When unchecked, the exporter does not poll meters for data for this exporter. The default setting is checked.

See Also:
Wildcards

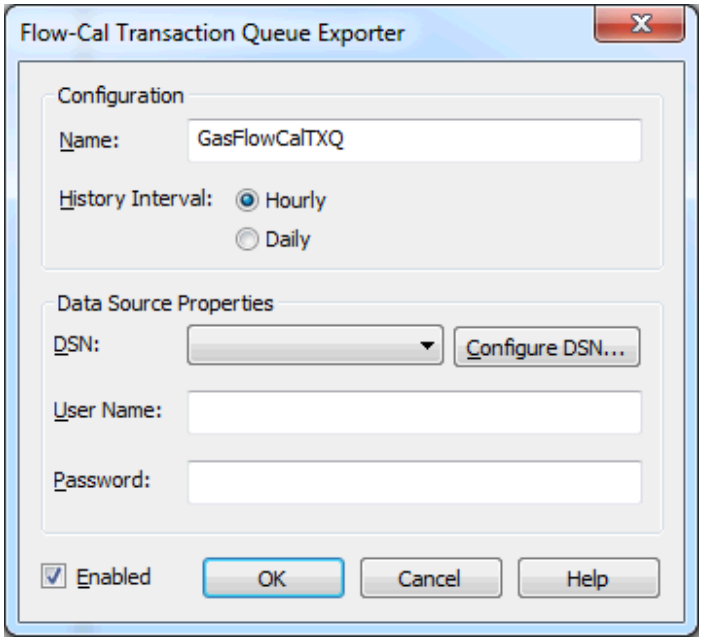
Flow-Cal Transaction Queue Exporter

The Flow-Cal Transaction Queue Exporter exports gas EFM meter data to a Flow-Cal Transaction Queue database using an ODBC DSN connection. Records are created for each EFM type: Config, Alarms, Events, and History. Records are generated using the EFM data set and inserted into the database for the Flow-Cal software to read. The exporter does not support polling/ exporting liquid EFM meter data.

Prerequisites

- 32-bit Oracle Instant Client with ODBC driver installed on the machine where the server is running
- User account with write permissions in the Flow-Cal Transaction Queue database
- Local 32-bit DSN configured to connect to the Flow-Cal Transaction Queue database

Note: Database values for the WRITE_TIMESTAMP and WRITE_DATE columns use the time zone set on the machine running the server; all other date and timestamp values use the time zone set on the EFM device.



Descriptions of the parameters are as follows:

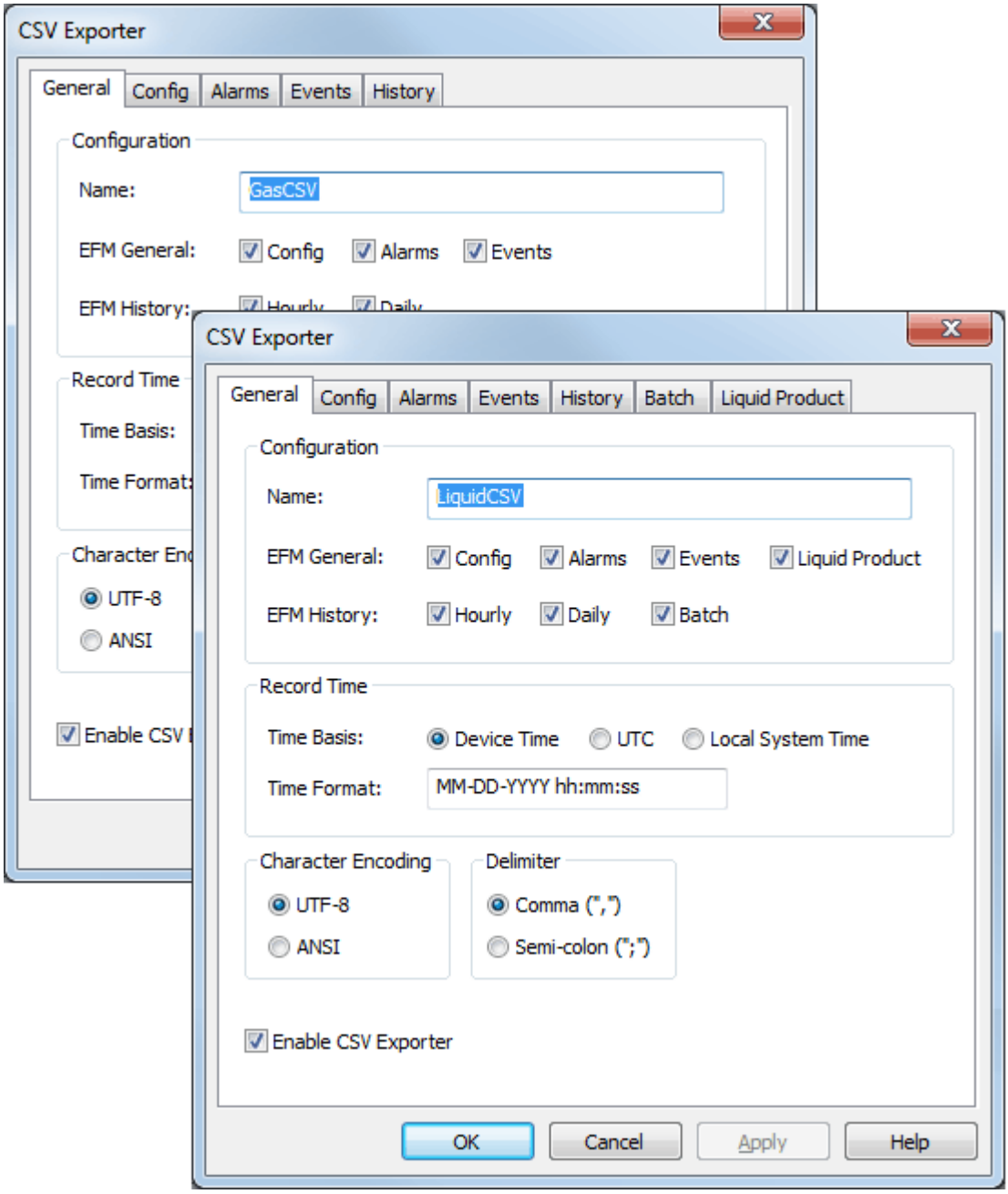
- **Name:** This parameter specifies the name of the Flow-Cal Transaction Queue Exporter being configured. When a new Flow-Cal Transaction Queue Exporter is created, this parameter generates a name that is unique across all other exporters within the poll group. The default setting is "GasFlowCalTXQ". Each additional exporter created has an automatically incremented integer attached to the end of the default name.
- **EFM History Type** (Hourly or Daily): This parameter specifies the type of history data to be output from the meter. Each Flow-Cal Transaction Queue Exporter can be set to Hourly or Daily. To export both Hourly and Daily historical records, configure two exporters with one set to Hourly and the other set to Daily. Both exporters may export to the same DSN.
- **DSN**: Specify the existing database connection object (a prerequisite for the Flow-Cal Transaction Queue Exporter). Contact a systems Administrator for the correct DSN selection and configuration settings for connecting to the Flow-Cal Transaction Queue database.

  Note: If changes are made to the DSN configuration in the Microsoft ODBC Data Source Administrator, the exporter must be disabled and re-enabled to use the new DSN configuration. Starting and stopping the server also applies the new DSN configuration to the exporter.

- **Configure DSN**: This button launches the Windows 32-bit ODBC Data Source Administrator, which can configure a DSN.
- **User Name**: This parameter specifies the account to be used for the DSN connection.
- **Password**: This parameter specifies a password for the specified user account; only necessary if the data source requires it.
- **Enabled**: When checked, this option allows exporting in the Flow-Cal Transaction Queue Exporter. When unchecked, the exporter does not send data to the Flow-Cal Transaction Queue database. The default setting is checked.

CSV Exporters

The CSV exporter exports gas or liquid meter EFM data to CSV files. The exporter supports multiple meters per export, differentiating each meter with a unique file name and file path.
An output file is created for each enabled EFM type; for gas meters, that can be Config, Alarms, Events, and History; for liquid meters, that can be Config, Liquid Product, Alarms, Events, History, and Batch.
Note: When actively reading or writing CSV data, the CSV exporter enforces a file-locking scheme that prohibits external entities from opening the output file until the read or write is complete.



Descriptions of the parameters are as follows:

- **Name:** This parameter specifies the name of the CSV exporter that is being configured. When a new CSV exporter is created, this parameter generates a name that is unique across all other exporters. The name can be customized from the defaults of "GasCSV" and “LiquidCSV”. Each additional file created has an automatically incremented integer attached to the end of the name.
- **EFM General:** This parameter specifies which of the EFM types are output to the target. Gas options include Config, Alarms, and Events. Liquid options include Config, Alarms, Events, and Liquid Products. All options are checked by default. Descriptions of the options are as follows:
  - **Config:** When checked, Configuration data is enabled for export.
  - **Alarms:** When checked, Alarms data is enabled for export.
  - **Events:** When checked, Events data is enabled for export.

- **Liquid Product:** When checked, Liquid Product data is enabled for export. This option is only available for liquid exporters.
  Note: Outputs may also be enabled or disabled through their specific tab.

- **EFM History:** This parameter specifies the type of history data output for the meter. Gas options include hourly and daily. Liquid options include hourly, daily, and batch. All options are enabled by default. Descriptions of the options are as follows:
  - **Hourly:** When checked, hourly history data is enabled for export.
  - **Daily:** When checked, daily history data is enabled for export.
  - **Batch:** When checked, Batch Output is enabled for export. This option is only available for liquid exporters.
    Note: Outputs may also be enabled or disabled through their specific tab.

- **Time Basis:** This parameter specifies the format of the EFM time records. Options include Device Time, UTC, and Local System Time. The default setting is Device Time. Descriptions of the options are as follows:
  - **Device Time:** When selected, the EFM time records are the default time of the device.
  - **UTC:** When selected, the EFM time records are in Coordinated Universal Time (UTC).
  - **Local System Time:** When selected, the EFM time records are the time of the local system.
    Note: This setting does not affect any wildcards that may be set in the Time Format parameter.

- **Time Format:** This parameter allows users to edit the Time Format of the output file. Wildcards include MM, DD, YYYY, hh, mm, ss, and AMPM. Users can arrange the wildcards in any order and delimit them as desired. All other characters are output as written. The default setting is MM-DD-YYYY hh:mm:ss.
  Important: If the string is changed to YYYY-DD-MM hh:mm:ss and the output CSV is loaded to Microsoft Excel, the string is interpreted in a special way and displayed according to Excel's own date/time column rules.
  Note: Records are stored in memory as UTC. To load and convert record times to a different Time Basis, manage Daylight Saving Time, and so forth, all elements of the time/date must be recorded. For example, if a user enters "DD-MM-YY hh:mm (AMPM)" and the current record time is "09/12/2012 16:05", the value output to the file is "12-09-12 4:05 (PM)".

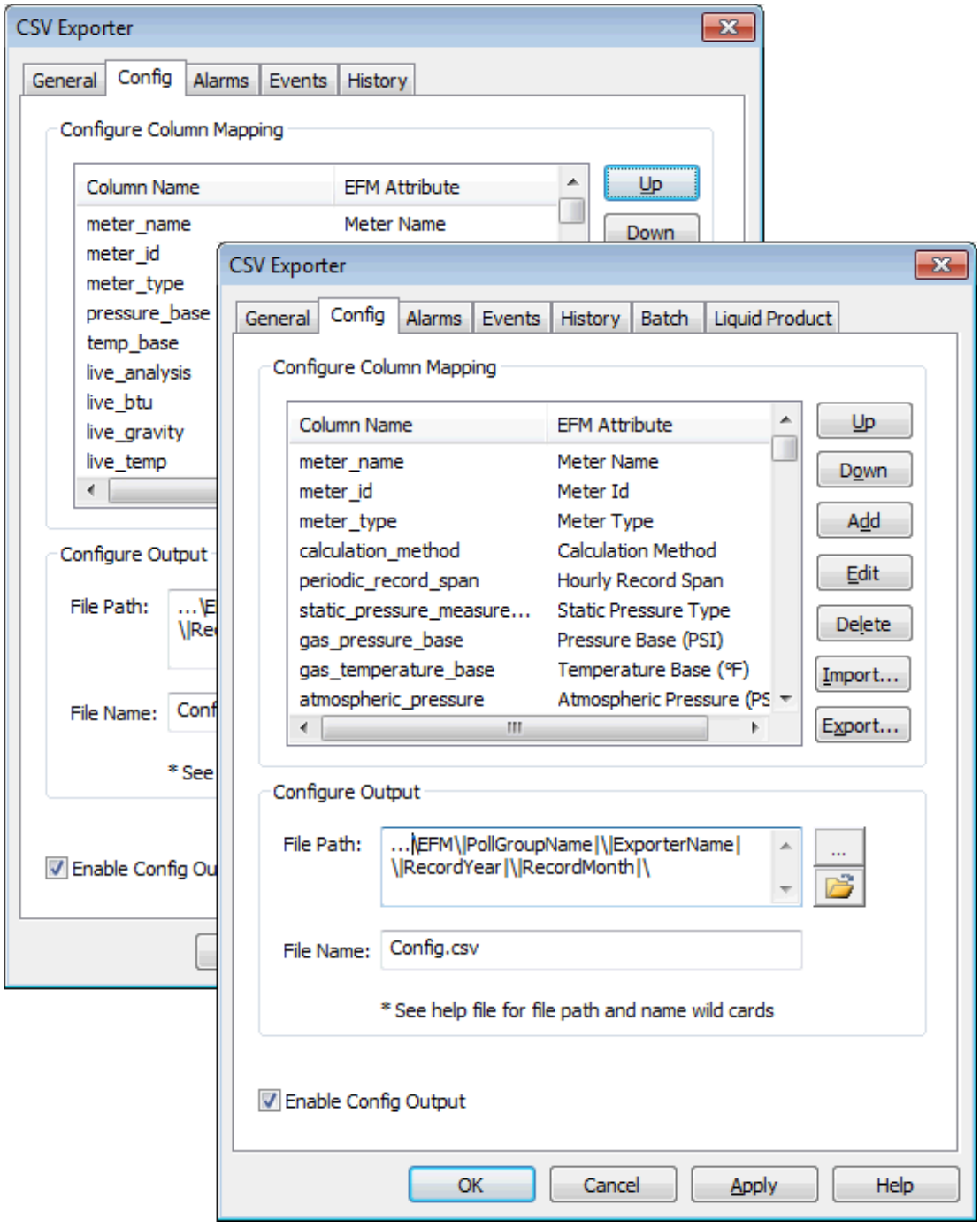
- **Character Encoding:** This parameter specifies the character encoding, which affects the text that is generated on one computer or system and consumed on another computer or system. Options include UTF-8 and ANSI. The default setting is UTF-8. Descriptions of the options are as follows:
  - **UTF-8:** When selected, the code points are represented by sequences of bytes that are up to 4 bytes long. UTF-8 (or 8-bit Unicode Transformation Format) is a variable length character encoding for Unicode that is ANSI compatible and compact. Information about the length of the sequence is encoded in the upper bits of each byte of the sequence.
  - **ANSI:** When selected, ASCII encoding is extended to different languages. The lower 127 characters retain the ASCII character mapping and the top 128 characters vary depending on the system.
    Note: If a file is selected for import that does not contain a Byte Order Mark (BOM), the import assumes UTF-8.
- **Delimiter:** This parameter specifies the separator character used in writing. It is ignored when reading. Options include comma and semi-colon. The default setting is comma.

- **Enable CSV Exporter:** When checked, this option enables polling in the CSV exporter. When unchecked, the CSV exporter does not poll. The default setting is checked.

See Also:
Wildcards

Config Output

The Config Output supports one set of records for a given meter. The attribute lists depends on whether the CSV exporter is for a gas meter or a liquid meter.



Descriptions of the parameters are as follows:

- **Column Name/EFM Attribute:** This field lists all attributes that are available by default. The order of the attributes may be customized using the navigational buttons.
  Note: Not all attributes are supported by all EFM-enabled drivers. For more information on supported attributes, refer to the driver's help documentation.
- **Up:** When selected, this button moves the selected attribute up one spot in the list.
- **Down:** When selected, this button moves the selected attribute down one spot in the list.
- **Add:** When selected, this button adds an attribute to the record at the top of the list. The same attribute can be added to the record more than once. For more information, refer to **Mapping a CSV Column to an EFM Attribute**.
- **Edit:** When selected, this button is used to edit a selected attribute. For more information, refer to **Mapping a CSV Column to an EFM Attribute**.
- **Delete:** When selected, this button deletes the selected attribute from the record.
- **Import:** When selected, this button invokes the Import CSV Header dialog, which is used to locate and select a CSV header for import into the record.
  Note: Importing a column header from an existing file eliminates the existing map. Users must then go through the columns and assign the attributes.
- **Export:** When selected, this button exports the configured column names to a file of the user's choice.
- **File Path:** This parameter specifies the output file location on the file system. Although a path is generated by default (using wildcards for the Poll group name, exporter name, record year, and record month), users can browse to and select a different location. To browse for and select a new file location, click the **Browse** icon. To open the file path without wildcards, click the **Open** icon.
- **File Name:** This parameter specifies the name of the record. It can be used for more than one set of records. The default setting is "Config.csv".
- **Enable Config Output:** When checked, the Config Output is enabled for polling. The default setting is checked.

Configuration Field Mappings

The Config Output supports a number of enumerated values. For more information, refer to the table below.[1]

Parameter	Description
Meter Type	Orifice = 1 Positive Displacement = 2 Turbine = 3 Ultrasonic = 4 Liquids = 5 Vcone = 6 Coriolis = 7 Line Pack = 8
Calculation Method	Aga3 1985 = 1 Aga3 1992 = 2 Aga5 = 3 Aga7 = 4 Vcone4 = 5 Aga11 = 6 Line Pack Calc = 7

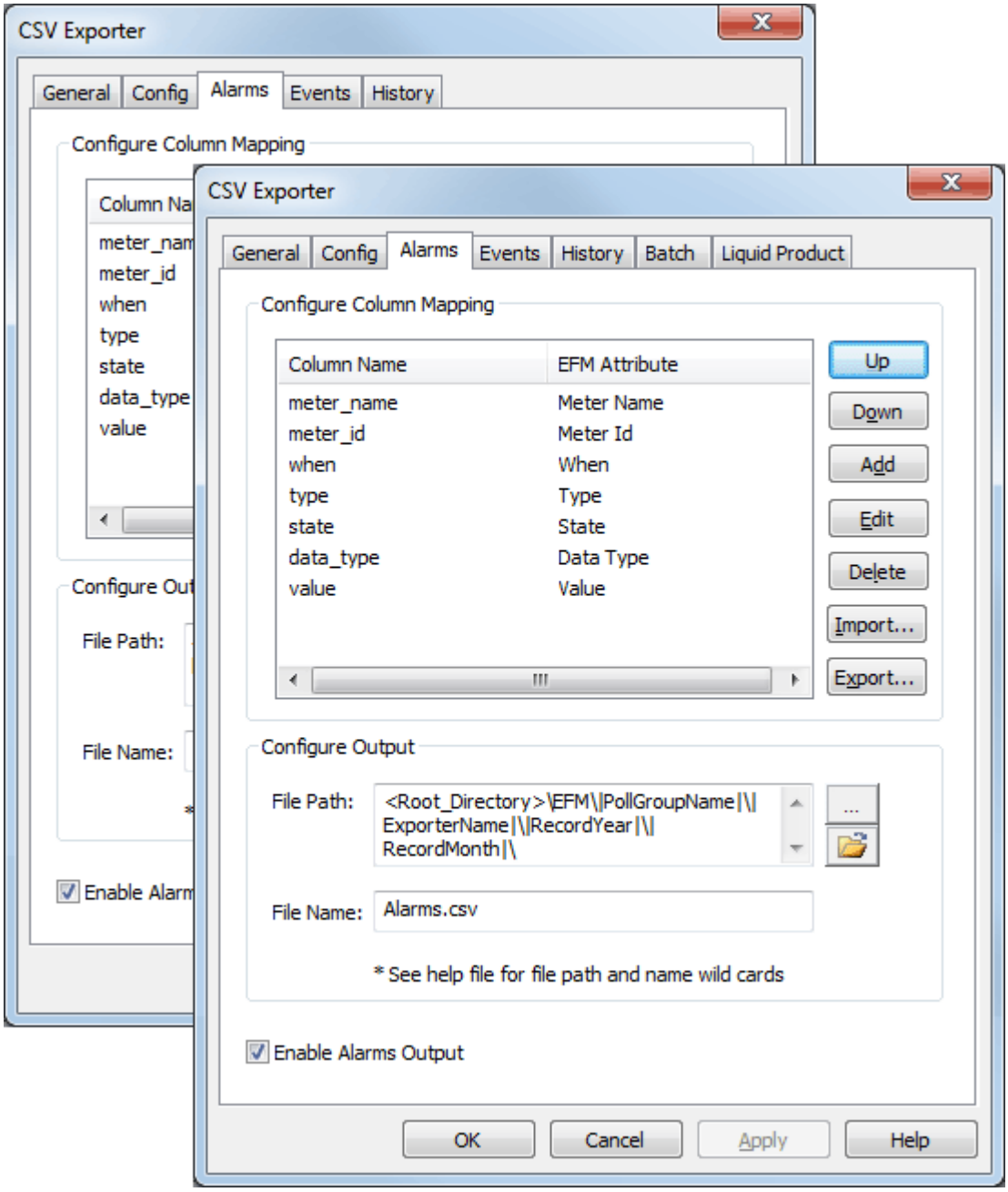
Parameter	Description
Meter Tap	Flange = 1 Pipe = 2
Static Pressure Tap	Up = 1 Down = 2
Units of Measurement	English = 1 Metric = 2
Hourly Record Span	Leading = 1 (Leading | Contract Hour 8 = 8:00-8:59) Trailing = 2 (Trailing | Contract Hour 8 = 7:01-8:00)
BTU Base	Wet = 1 Dry = 2 As Delivered = 3
Pipe and Plate Material	Stainless Steel = 1 Carbon Steel = 2 Monel = 3
FPV Method	Nx 19 = 1 Aga8 Detail = 2 Aga8 Gross1 = 3 Aga8 Gross2 = 4
Static Pressure Type	Gauge = 1 Absolute = 2
Unit Volume	Million Cubic Meters = 1 Thousand Cubic Meters = 2[2] Hundred Cubic Meters = 3 Cubic Meters = 4 Million Cubic Feet = 5 Thousand Cubic Feet = 6[3] Hundred Cubic Feet = 7 Cubic Feet = 8
Unit K Factor	Counts Per Million Cubic Meters = 1 Counts Per Thousand Cubic Meters = 2[2] Counts Per Hundred Cubic Meters = 3 Counts Per Cubic Meter = 4 Counts Per Million Cubic Feet = 5 Counts Per Thousand Cubic Feet = 6[3] Counts Per Hundred Cubic Feet = 7 Counts Per Cubic Foot = 8

Notes:

1. This table refers to attributes that are specific to gas meters.
2. This is the default if the units are Metric.
3. This is the default if the units are English.

Alarms Output

The Alarms Output supports more than one set of records for a given meter.



Descriptions of the parameters are as follows:

- **Column Name/EFM Attribute:** This field lists all attributes that are available by default. The order of the attributes may be customized using the navigational buttons.
  Note: Not all attributes are supported by all EFM-enabled drivers. For more information on supported attributes, refer to the driver's help documentation.
- **Up:** When selected, this button moves the selected attribute up one spot in the list.
- **Down:** When selected, this button moves the selected attribute down one spot in the list.
- **Add:** When selected, this button adds an attribute to the record at the top of the list. The same attribute can be added to the record more than once. For more information, refer to **Mapping a CSV Column to an EFM Attribute**.
- **Edit:** When selected, this button is used to edit a selected attribute. For more information, refer to **Mapping a CSV Column to an EFM Attribute**.

- **Delete:** When selected, this button deletes the selected attribute from the record.
- **Import:** When selected, this button invokes the Import CSV Header dialog, which is used to locate and select a CSV header for import into the record.
  Note: Importing a column header from an existing file eliminates the existing map. Users must then go through the columns and assign the attributes.
- **Export:** When selected, this button exports the configured column names to a file of the user's choice.
- **File Path:** This parameter specifies the output file location on the file system. Although a path is generated by default (using wildcards for the Poll group name, exporter name, record year, and record month), users can browse to and select a different location. To browse for and select a new file location, click the **Browse** icon. To open the file path without wildcards, click the **Open** icon.
- **File Name:** This parameter specifies the name of the record. It can be used for more than one set of records. The default setting is "Alarms.csv".
- **Enable Alarms Output:** When checked, the Alarms Output is enabled for polling. The default setting is checked.

Supported Alarms Output Parameters

The Alarms Output type includes the following parameters:

- A timestamp (displayed in Device, Host system, or UTC time format) that marks when the alarm occurred.
- The type of alarm.
- The state of the alarm.
- The value of the alarm.
- The data type of the alarm value.

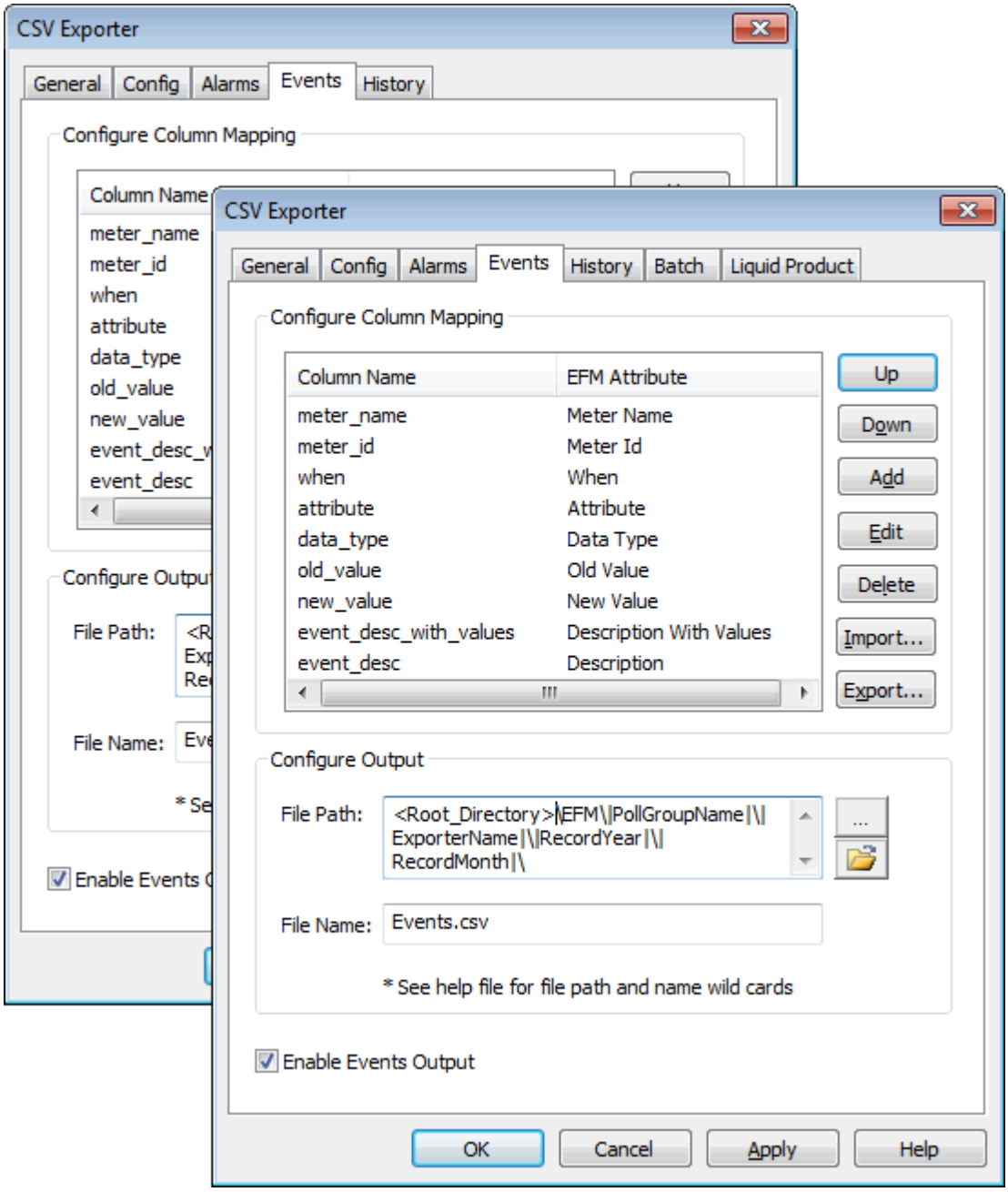
Note: The type, state, and alarm value data type fields are output as numeric codes. For more information, refer to the table below.

Parameter	Mapping
Alarm Data Type	Output corresponds to the Win32 VARTYPE data type.*
Alarm State	Off = 1 On = 2 Hi = 3 Lo = 4
Alarm Type	None = 0 Differential Pressure = 1 Static Pressure = 2 Temperature = 3 Cutoff = 4 Backflow = 5 Battery = 6

*Values for this data type correspond to the VARENUM enumeration, which is documented by Microsoft/MSDN at **VarEnum Enumeration**.

Events Output

The Events Output supports more than one set of records for a given meter.



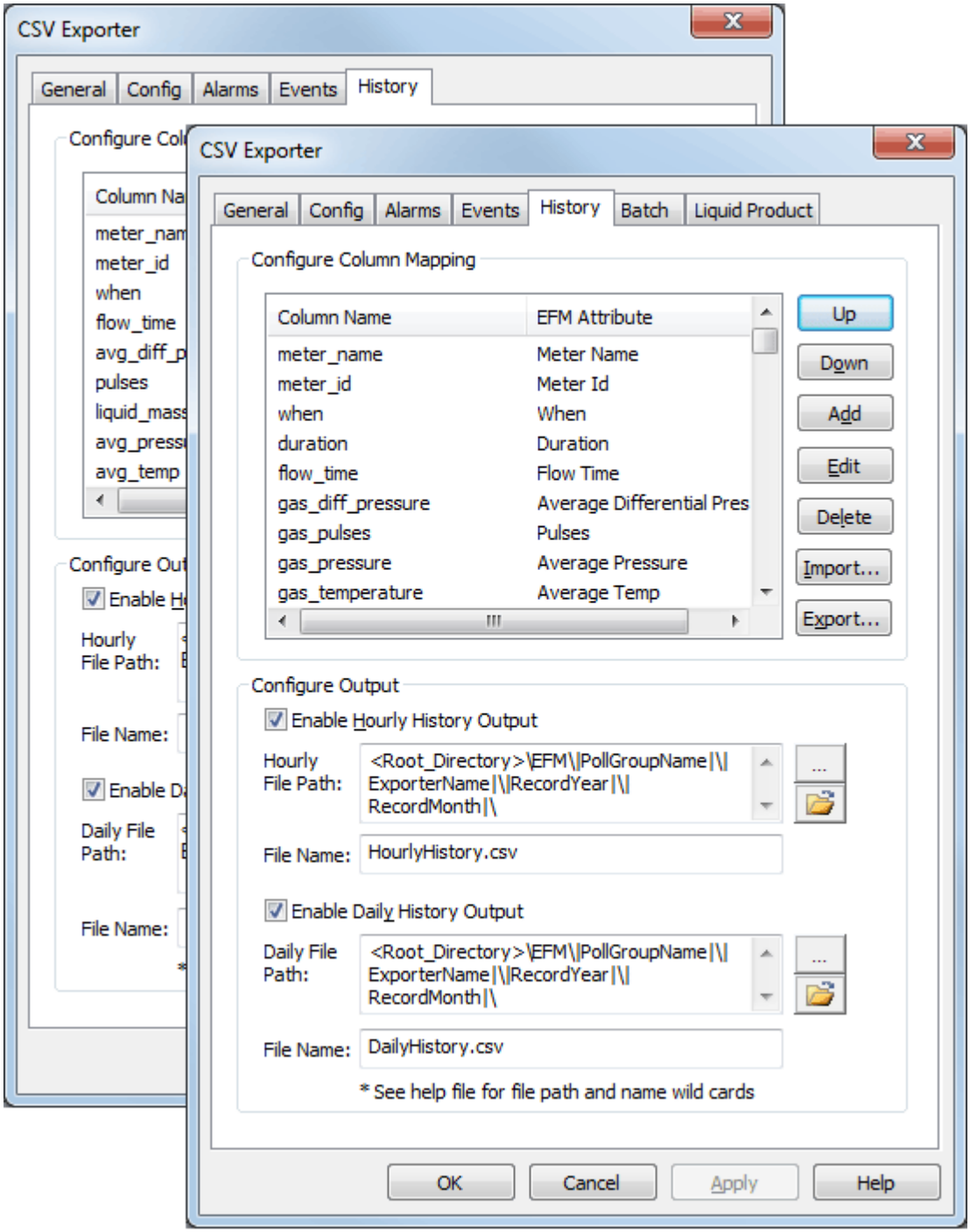
Descriptions of the parameters are as follows:

- **Column Name/EFM Attribute:** This field lists all attributes that are available by default. The order of the attributes may be customized using the navigational buttons.
  Note: Not all attributes are supported by all EFM-enabled drivers. For more information on supported attributes, refer to the driver's help documentation.
- **Up:** When selected, this button moves the selected attribute up one spot in the list.
- **Down:** When selected, this button moves the selected attribute down one spot in the list.
- **Add:** When selected, this button adds an attribute to the record at the top of the list. The same attribute can be added to the record more than once. For more information, refer to **Mapping a CSV Column to an EFM Attribute**.
- **Edit:** When selected, this button is used to edit a selected attribute. For more information, refer to **Mapping a CSV Column to an EFM Attribute**.

- **Delete:** When selected, this button deletes the selected attribute from the record.
- **Import:** When selected, this button invokes the Import CSV Header dialog, which is used to locate and select a CSV header for import into the record.
  Note: Importing a column header from an existing file eliminates the existing map. Users must then go through the columns and assign the attributes.
- **Export:** When selected, this button exports the configured column names to a file of the user's choice.
- **File Path:** This parameter specifies the output file location on the file system. Although a path is generated by default (using wildcards for the poll group name, exporter name, record year, and record month), users can browse to and select a different location. To browse for and select a new file location, click the **Browse** icon. To open the file path without wildcards, click the **Open** icon.
- **File Name:** This parameter specifies the name of the record. It can be used for more than one set of records. The default setting is "Events.csv".
- **Enable Events Output:** When checked, the Events Output is enabled for polling. The default setting is checked.

History Output

The History Output supports more than one set of records for a given meter. The attribute lists depends on whether the CSV exporter is for a gas meter or a liquid meter.



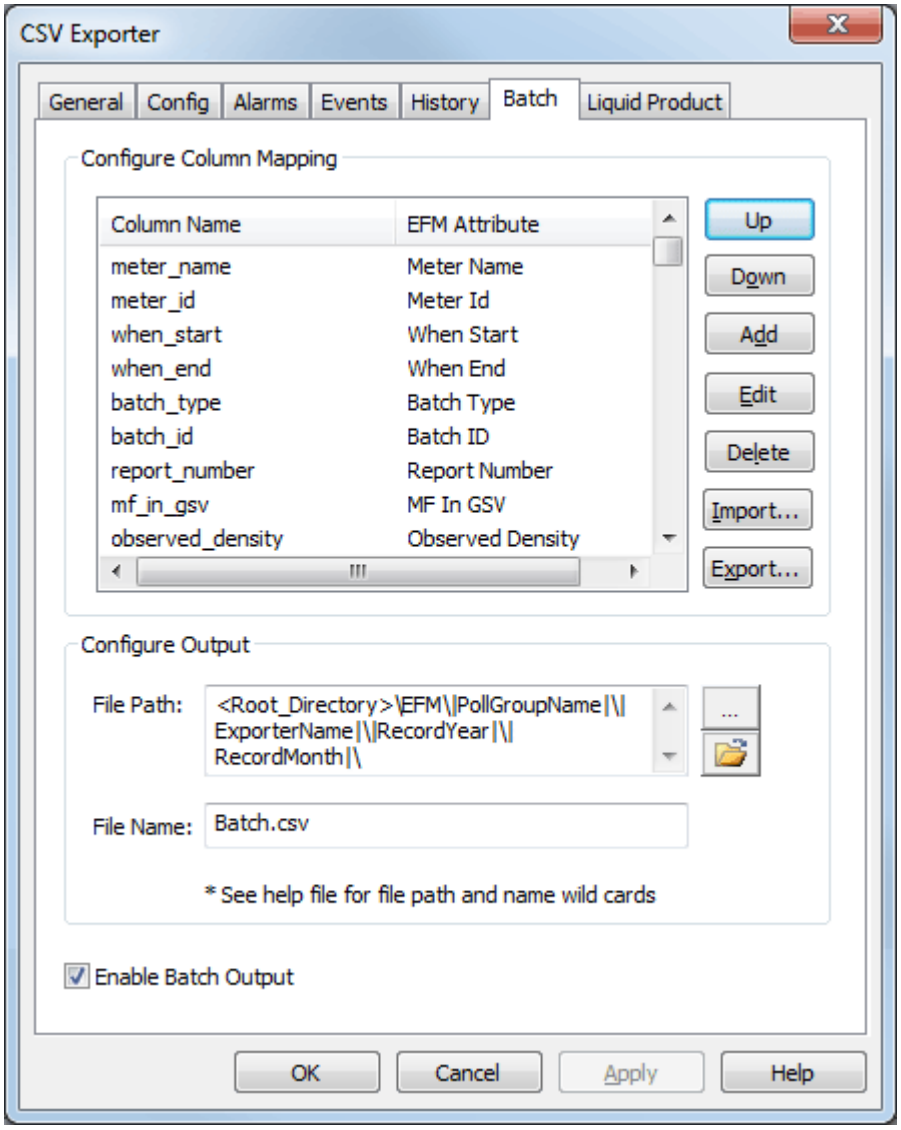
Descriptions of the parameters are as follows:

- **Column Name/EFM Attribute:** This field lists all attributes that are available by default. The order of the attributes may be customized using the navigational buttons.
  Note: Not all attributes are supported by all EFM-enabled drivers. For more information on supported attributes, refer to the driver's help documentation.
- **Up:** When selected, this button moves the selected attribute up one spot in the list.
- **Down:** When selected, this button moves the selected attribute down one spot in the list.

- **Add:** When selected, this button adds an attribute to the record at the top of the list. The same attribute can be added to the record more than once. For more information, refer to **Mapping a CSV Column to an EFM Attribute**.
- **Edit:** When selected, this button is used to edit a selected attribute. For more information, refer to **Mapping a CSV Column to an EFM Attribute**.
- **Delete:** When selected, this button deletes the selected attribute from the record.
- **Import:** When selected, this button invokes the Import CSV Header dialog, which is used to locate and select a CSV header for import into the record.
  Note: Importing a column header from an existing file eliminates the existing map. Users must then go through the columns and assign attributes.
- **Export:** When selected, this button exports the configured column names to a file of the user's choice.
- **Enable Hourly History Output:** When checked, polling for the Hourly History Output is enabled. The default setting is checked.
- **Hourly File Path:** This parameter specifies the Hourly History output file location on the file system. Although a path is generated by default (using wildcards for the poll group name, exporter name, record year, and record month), users can browse to and select a different location. To browse for and select a new file location, click the **Browse** icon. To open the file path without wildcards, click the **Open** icon.
- **File Name:** This parameter specifies the name of the Hourly History record. It can be used for more than one set of records. The default setting is "HourlyHistory.csv".
- **Enable Daily History Output:** When checked, polling for the Daily History Output is enabled. The default setting is checked.
- **Daily File Path:** This parameter specifies the Daily History Output's file path. Although a path is generated by default (using wildcards for the poll group name and exporter name), users can browse to and select a different location. To browse for and select a new file location, click the **Browse** icon. To open the file path without wildcards, click the **Open** icon.
- **File Name:** This parameter specifies the name of the Daily History record. It can be used for more than one set of records. The default setting is "DailyHistory.csv".

Batch Output

The Batch Output supports more than one set of CSV records for a given liquid meter.



Descriptions of the parameters are as follows:

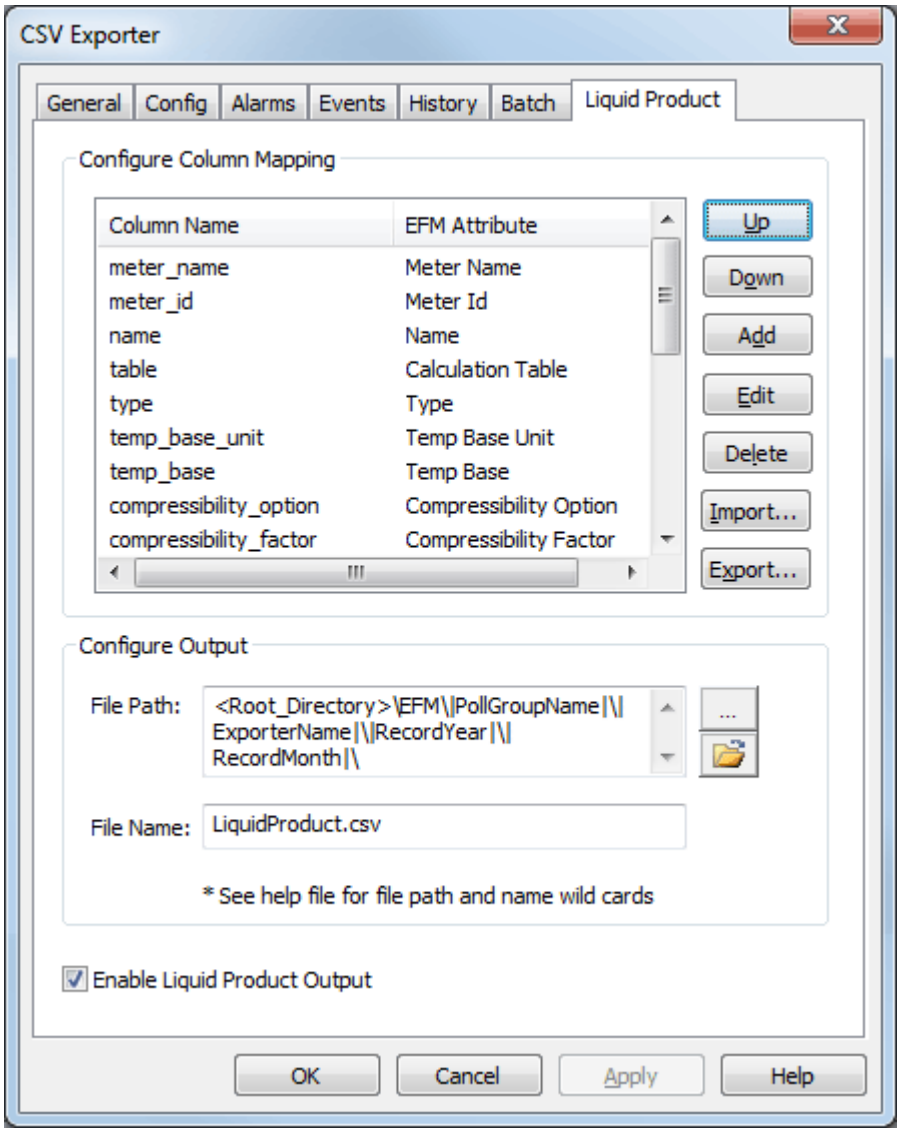
- **Column Name/EFM Attribute:** This field lists all attributes that are available by default. The order of the attributes may be customized using the navigational buttons.
  Note: Not all attributes are supported by all EFM-enabled drivers. For more information on supported attributes, refer to the driver's help documentation.
- **Up:** When selected, this button moves the selected attribute up one spot in the list.
- **Down:** When selected, this button moves the selected attribute down one spot in the list.
- **Add:** When selected, this button adds an attribute to the record at the top of the list. The same attribute can be added to the record more than once. For more information, refer to **Mapping a CSV Column to an EFM Attribute**.
- **Edit:** When selected, this button is used to edit a selected attribute. For more information, refer to **Mapping a CSV Column to an EFM Attribute**.
- **Delete:** When selected, this button deletes the selected attribute from the record.
- **Import:** When selected, this button invokes the Import CSV Header dialog, which is used to locate and select a CSV header for import into the record.

Note: Importing a column header from an existing file eliminates the existing map. Users must then go through the columns and assign attributes.

- **Export:** When selected, this button exports the configured column names to a file of the user's choice.
- **File Path:** This parameter specifies the output file location on the file system. Although a path is generated by default (using wildcards for the poll group name, exporter name, record year, and record month), users can browse to and select a different location. To browse for and select a new file location, click the **Browse** icon. To open the file path without wildcards, click the **Open** icon.
- **File Name:** This parameter specifies the name of the Hourly History record. It can be used for more than one set of records. The default setting is "Batch.csv".
- **Enable Batch Output:** When checked, Batch output is enabled for polling. The default setting is checked.

Liquid Product Output

The Liquid Product Output supports the liquid product CSV records for a given liquid meter.

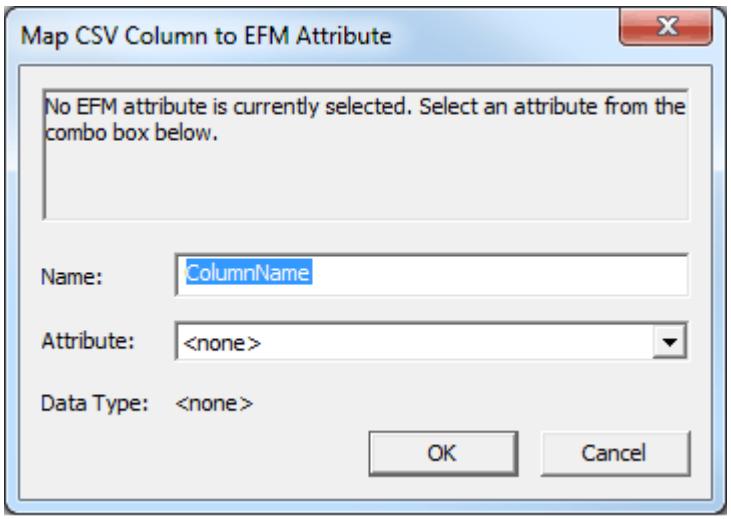


Descriptions of the parameters are as follows:

- **Column Name/EFM Attribute:** This field lists all attributes that are available by default. The order of the attributes may be customized using the navigational buttons.
  Note: Not all attributes are supported by all EFM-enabled drivers. For more information on supported attributes, refer to the driver's help documentation.
- **Up:** When selected, this button moves the selected attribute up one spot in the list.
- **Down:** When selected, this button moves the selected attribute down one spot in the list.
- **Add:** When selected, this button adds an attribute to the record at the top of the list. The same attribute can be added to the record more than once. For more information, refer to **Mapping a CSV Column to an EFM Attribute**.
- **Edit:** When selected, this button is used to edit a selected attribute. For more information, refer to **Mapping a CSV Column to an EFM Attribute**.
- **Delete:** When selected, this button deletes the selected attribute from the record.
- **Import:** When selected, this button invokes the Import CSV Header dialog, which is used to locate and select a CSV header for import into the record.
  Note: Importing a column header from an existing file eliminates the existing map. Users must then go through the columns and assign attributes.
- **Export:** When selected, this button exports the configured column names to a file of the user's choice.
- **File Path:** This parameter specifies the output file location on the file system. Although a path is generated by default (using wildcards for the poll group name, exporter name, record year, and record month), users can browse to and select a different location. To browse for and select a new file location, click the **Browse** icon. To open the file path without wildcards, click the **Open** icon.
- **File Name:** This parameter specifies the name of the Hourly History record. It can be used for more than one set of records. The default setting is "LiquidProduct.csv".
- **Liquid Product Output:** When checked, Liquid Product output is enabled for polling. The default setting is checked.

Mapping a CSV Column to an EFM Attribute

This dialog is used to add or edit an EFM attribute in the record.



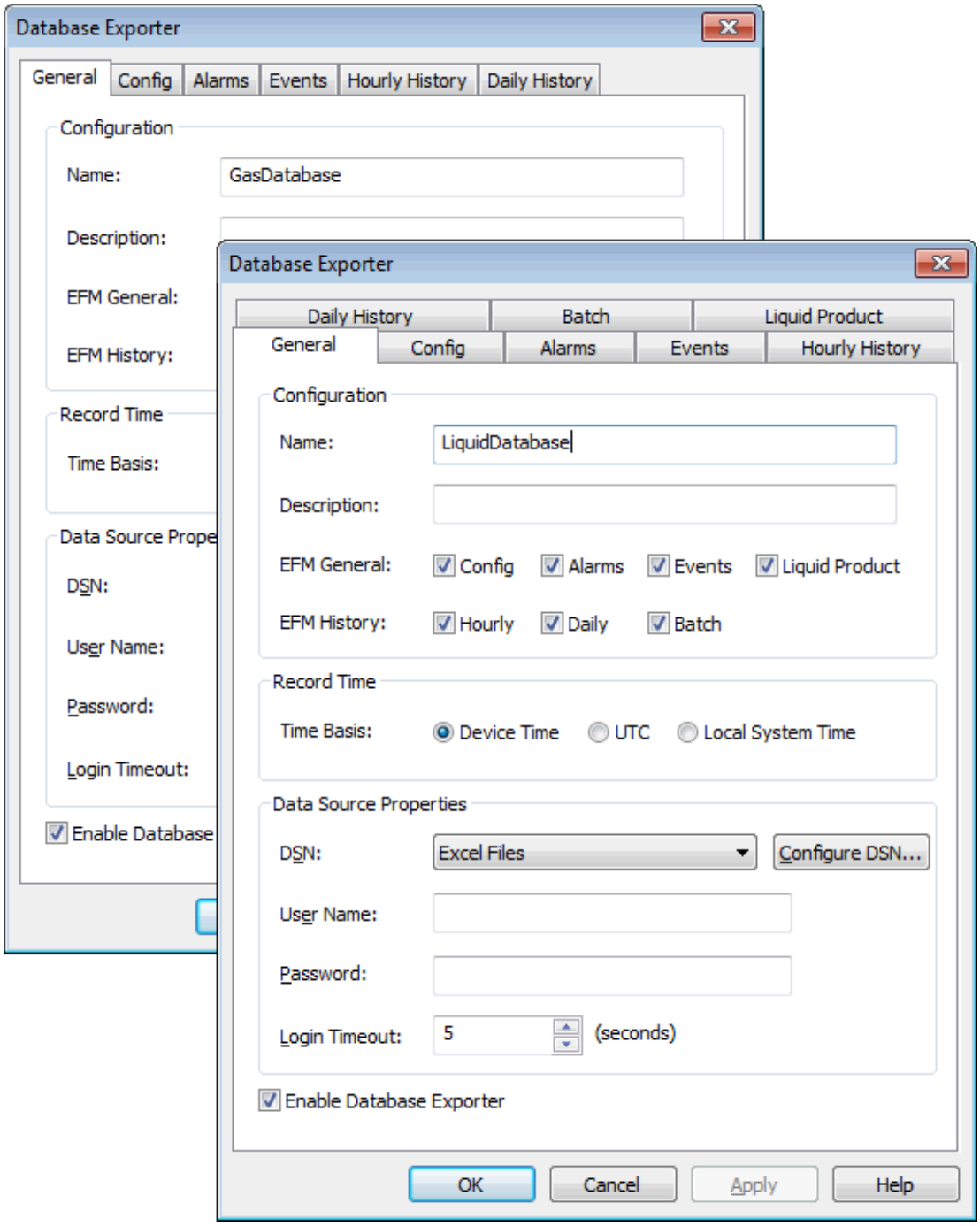
Descriptions of the parameters are as follows:

- **Name:** This parameter specifies the column name for the new EFM attribute. The default setting is ColumnName.
- **Attribute:** This drop-down menu lists all attributes that are available for selection. An attribute can be mapped to more than one column and appear multiple times in the row of CSV data. The default setting is <none>.
  Note: An attribute that is specified as <none> is displayed as an empty column in the row of CSV data. This may be useful for adding lines of space to an output record.
- **Data Type:** This specifies the attribute's default data type. The default setting is <none>.

Note: The order of the items in the Attribute list is significant. The topmost item represents the leftmost CSV column; the bottom item represents the rightmost CSV column.

Database Exporter

The database exporter exports gas or liquid meter EFM data to SQL or ODBC databases for analytical and storage purposes. It supports multiple meters per export differentiating each meter with a unique table. An output file is created for each enabled EFM type; for gas meters, that can be Config, Alarms, Events, and History; for liquid meters, that can be Config, Liquid Product, Alarms, Events, History, and Batch.



Descriptions of the parameters are as follows:

- **Name:** This parameter specifies a unique name for the exporter. Each EFM Exporter must have a unique name that can neither start with an underscore nor contain a period. The maximum length is 1024 characters. The name can be customized from the defaults of "GasDatabase" and “LiquidDatabase”.
- **Description:** This optional parameter describes the database exporter and may be included in the export.

- **EFM General:** This parameter specifies which of the EFM types are output to the target. Gas options include Config, Alarms, and Events. Liquid options include Config, Alarms, Events, and Liquid Product.

All options are checked by default. Descriptions of the options are as follows:

- **Config:** When checked, Config Output is enabled for export.
- **Alarms:** When checked, Alarms Output is enabled for export.
- **Events:** When checked, Events Output is enabled for export.
- **Liquid Product:** When checked, Liquid Product Output is enabled for export. This option is only available for liquid exporters.
  Note: Outputs may also be enabled or disabled through their specific tab.

- **EFM History:** This parameter specifies the type of history data to be output for the meter. Gas options include hourly and daily. Liquid options include hourly, daily, and batch. All options are checked by default. Descriptions of the options are as follows:
  - **Hourly:** When checked, Hourly History Output is enabled for export.
  - **Daily:** When checked, daily meter data is enabled for export.
  - **Batch:** When checked, Batch Output is enabled for export. This option is only available for liquid exporters.
    Note: Outputs may also be enabled or disabled through their specific tab.

- **Time Basis:** This parameter specifies the format of the EFM time records. Options include Device Time, UTC, and Local System Time. The default setting is Device Time. Descriptions of the options are as follows:
  - **Device Time:** When selected, the EFM time records are the default time of the device.
  - **UTC:** When selected, the EFM time records are in Coordinated Universal Time (UTC).
  - **Local System Time:** When selected, the EFM time records are the time of the local system.
- **DSN:** This parameter specifies the DSN for the database. If the DSN is not listed, it must be configured. For more information, refer to **Configure DSN**.

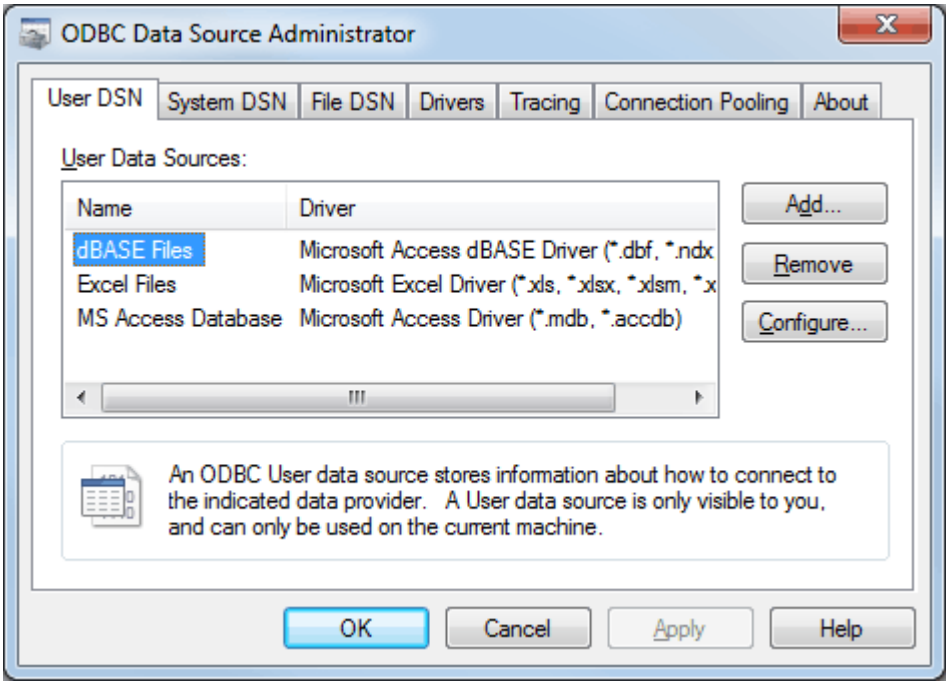
  Note: If changes are made to the DSN configuration in the Microsoft ODBC Data Source Administrator, the exporter must be disabled and re-enabled to use the new DSN configuration. Starting and stopping the server also applies the new DSN configuration to the exporter.

- **User Name:** This parameter specifies a user name for the DSN. It is only necessary if the data source requires it.
- **Password:** This parameter specifies a password for the DSN. It is only necessary if the data source requires it.
- **Login Timeout:** This parameter specifies how long the server waits for a response when attempting to connect to the DSN. At the end of that time, the connection attempt times out. The valid range is 1 to 99999 seconds. The default setting is 5 seconds.
- **Enable Database Exporter:** When checked, this option enables polling in the database exporter. When unchecked, the database exporter does not poll. The default setting is checked.

Configure DSN

The database exporter supports MS SQL Server, MySQL, PostrgreSQL, and MS Access DSNs. For more information on configuring a DSN, refer to the instructions below.

1. To start, click **Configure DSN**.
2. In the **Microsoft® ODBC Data Source Administrator** dialog, select the **User DSN** or **System DSN** tab depending on the type of DSN that is needed.

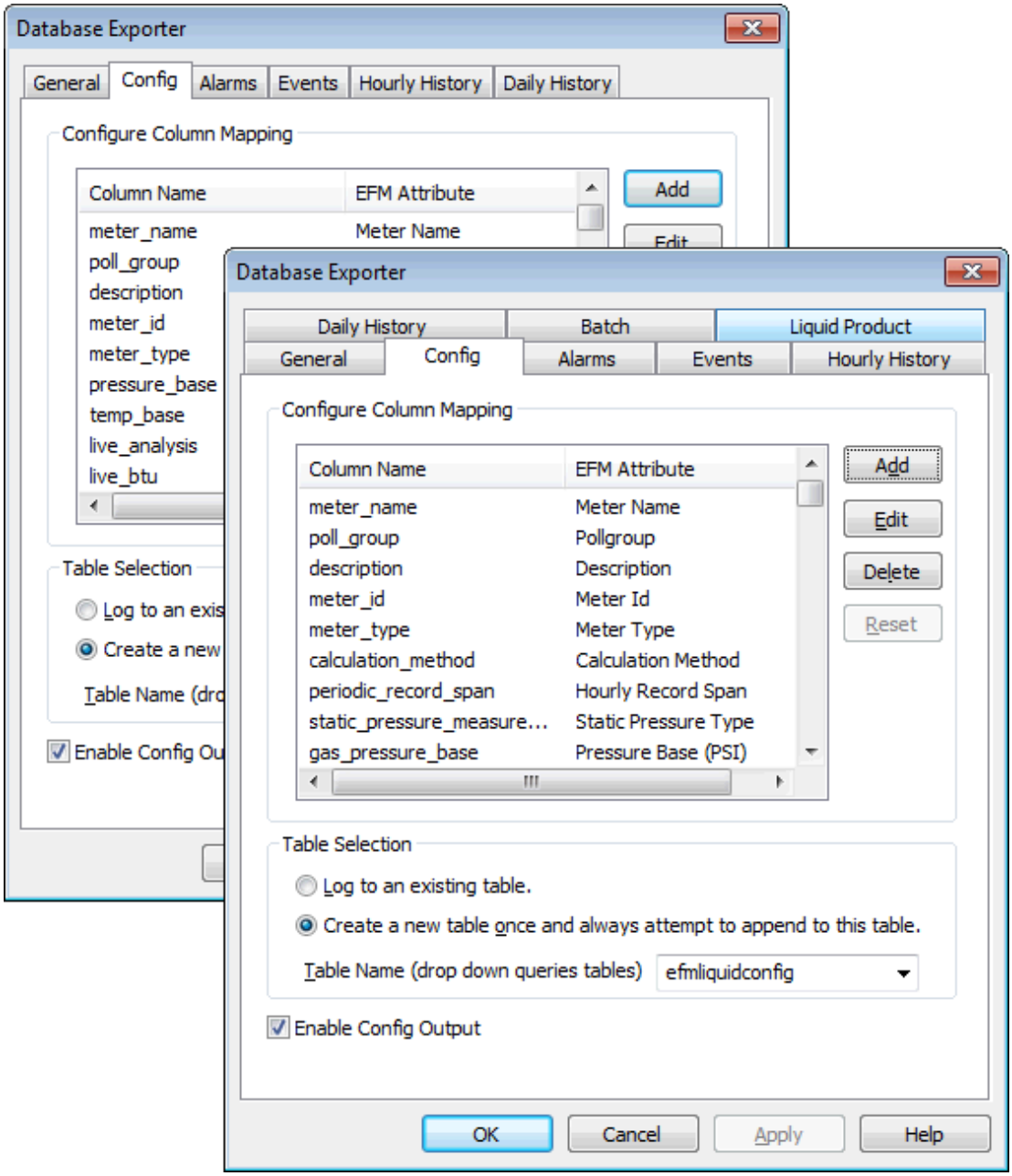


3. Next, click **Add**.
4. In **Create New Data Source**, locate and select the driver for the specific database. Then, click **Finish**.
5. Continue through the DSN Wizard.

   Note: The dialogs and fields presented in the DSN Wizard depends on the database connected and the DSN configured. If presented with a **Test** button, select it to verify that the DSN setup is functional.

Config Output

The Config Output supports one set of records for a given meter. The attribute lists depends on whether the database exporter is for a gas meter or a liquid meter.



Descriptions of the parameters are as follows:

- **Column Name/EFM Attribute:** This field lists all attributes that are available by default.
  Note: Not all attributes are supported by all EFM-enabled drivers. For more information on supported attributes, refer to the driver's help documentation.
- **Add:** When selected, this button adds an attribute to the record at the bottom of the list. The same attribute can be added to the record more than once. For more information, refer to **Mapping a Database Table Column to an EFM Attribute**.
- **Edit:** When selected, this button edits a selected attribute. For more information, refer to **Mapping a Database Table Column to an EFM Attribute**.
- **Delete:** When selected, this button deletes the selected attribute from the record.
- **Reset:** When selected, this button clears the column mappings. It is only available when the Table Selection is set to Log to an existing table.

- **Table Selection:** This option specifies the table. Options include Log to an existing table and Create a new table once and always attempt to append to this table. The default setting is Create a new table once and always attempt to append to this table.
- **Table Name:** This parameter specifies the table name. The drop-down menu queries existing tables when the Table Selection option is set to Log to an existing table. The default table name is efmgasconfig for gas meters and efmliquidconfig for liquid meters.
- **Enable Config Output:** When checked, the Config Output is enabled for export. The default setting is checked.

Configuration Field Mappings

The Config Output supports a number of enumerated values. For more information, refer to the table below.

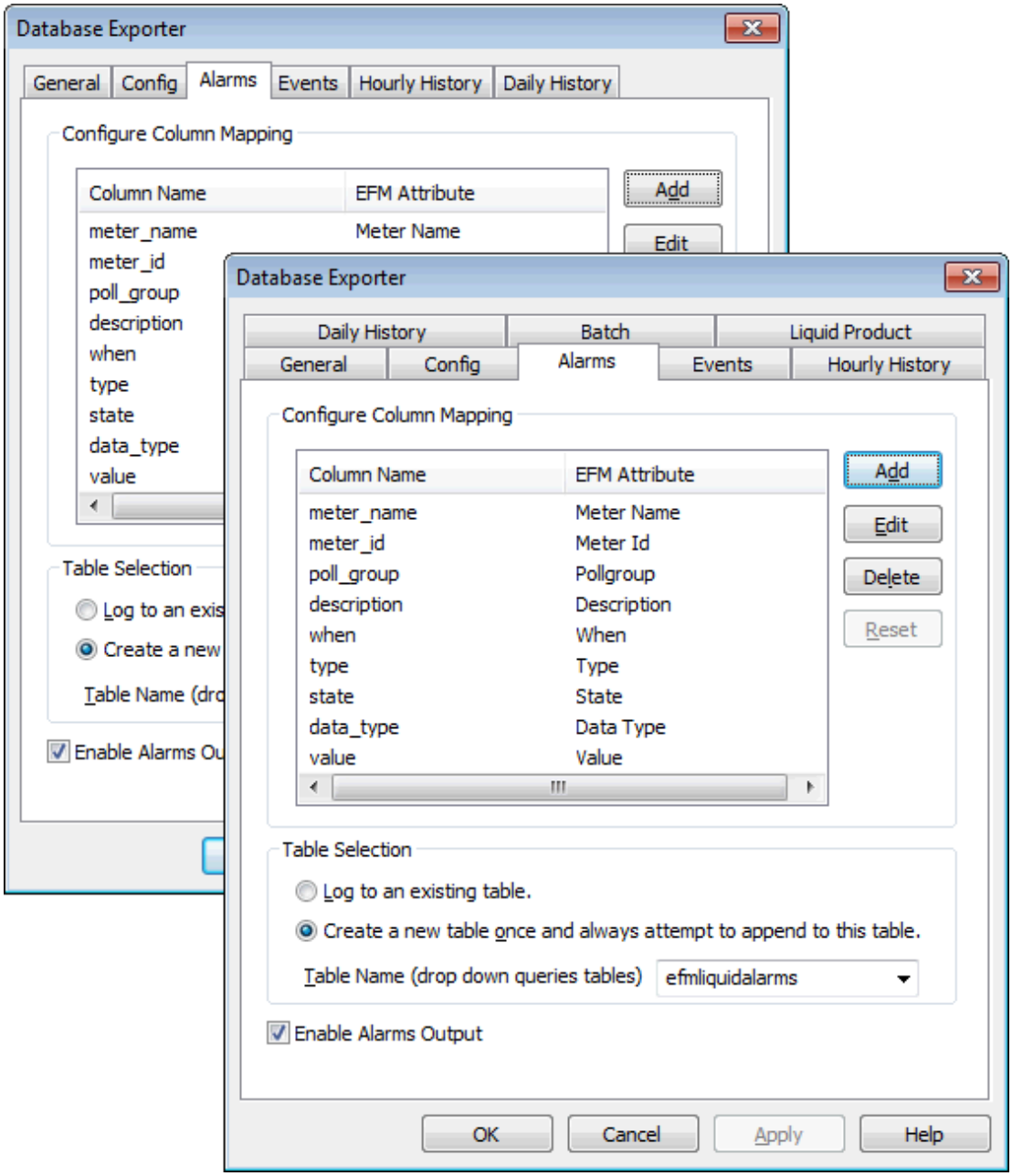
Parameter	Description
Meter Type	Orifice = 1 Positive Displacement = 2 Turbine = 3 Ultrasonic = 4 Liquids = 5 Vcone = 6 Coriolis = 7 Line Pack = 8
Calculation Method	Aga3 1985 = 1 Aga3 1992 = 2 Aga5 = 3 Aga7 = 4 Vcone4 = 5 Aga11 = 6 Line Pack Calc = 7
Meter Tap	Flange = 1 Pipe = 2
Static Pressure Tap	Up = 1 Down = 2
Units of Measurement	English = 1 Metric = 2
Hourly Record Span	Leading = 1 (Leading | Contract Hour 8 = 8:00-8:59) Trailing = 2 (Trailing | Contract Hour 8 = 7:01-8:00)
BTU Base	Wet = 1 Dry = 2 As Delivered = 3
Pipe and Plate Material	Stainless Steel = 1 Carbon Steel = 2 Monel = 3
FPV Method	Nx 19 = 1 Aga8 Detail = 2 Aga8 Gross1 = 3 Aga8 Gross2 = 4
Static Pressure Type	Gauge = 1 Absolute = 2

Parameter	Description
Unit Volume	Million Cubic Meters = 1 Thousand Cubic Meters = 2* Hundred Cubic Meters = 3 Cubic Meters = 4 Million Cubic Feet = 5 Thousand Cubic Feet = 6** Hundred Cubic Feet = 7 Cubic Feet = 8
Unit K Factor	Counts Per Million Cubic Meters = 1 Counts Per Thousand Cubic Meters = 2* Counts Per Hundred Cubic Meters = 3 Counts Per Cubic Meter = 4 Counts Per Million Cubic Feet = 5 Counts Per Thousand Cubic Feet = 6** Counts Per Hundred Cubic Feet = 7 Counts Per Cubic Foot = 8

*This is the default if the Units are Metric.
**This is the default if the Units are English.

Alarms Output

The Alarms Output supports more than one set of records for a given meter.



Descriptions of the parameters are as follows:

- **Column Name/EFM Attribute:** This field lists all attributes that are available by default.
  Note: Not all attributes are supported by all EFM-enabled drivers. For more information on supported attributes, refer to the driver's help documentation.
- **Add:** When selected, this button adds an attribute to the record at the bottom of the list. The same attribute can be added to the record more than once. For more information, refer to **Mapping a Database Table Column to an EFM Attribute**.
- **Edit:** When selected, this button is used to edit a selected attribute. For more information, refer to **Mapping a Database Table Column to an EFM Attribute**.
- **Delete:** When selected, this button deletes the selected attribute from the record.
- **Reset:** When selected, this button clears the column mappings. It is only available when the Table Selection is set to Log to an existing table.

- **Table Selection:** This option specifies the table. Options include Log to an existing table and Create a new table once and always attempt to append to this table. The default setting is Create a new table once and always attempt to append to this table.
- **Table Name:** This parameter specifies the table name. The drop-down menu queries existing tables when the Table Selection option is set to Log to an existing table. The default table name is efmgasalarms for gas meters and efmliquidalarms for liquid meters.
- **Enable Alarms Output:** When checked, the Alarms Output is enabled for export. The default setting is checked.

Supported Alarms Output Parameters

The Alarms Output type includes the following parameters:

- The meter's name.
- The meter's unique ID.
- The name of the EFM poll group that can be stored in the EFM record.
- The user-defined description of the EFM poll group for identification.
- A timestamp (displayed in Device, Host system, or UTC time format) that marks when the alarm occurred.
- The type of alarm.
- The state of the alarm.
- The value of the alarm.
- The data type of the alarm value.

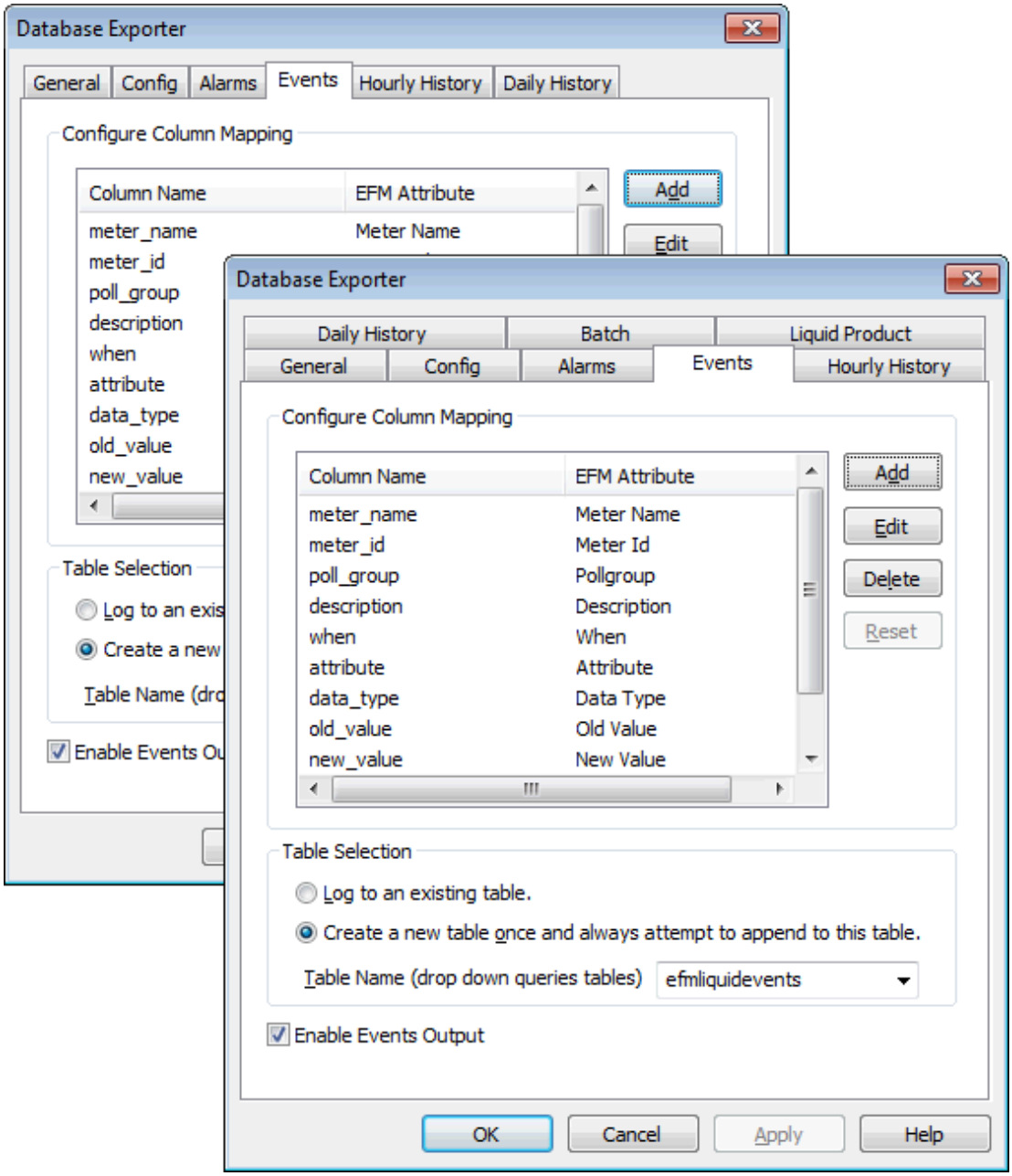
Note: The alarm type, state, and data type fields are output as numeric codes. For more information, refer to the table below.

Parameter	Mapping
Alarm Type	None = 0 Differential Pressure = 1 Static Pressure = 2 Temperature = 3 Cutoff = 4 Backflow = 5 Battery = 6 All = 7
Alarm State	Off = 1 On = 2 Hi = 3 Lo = 4
Alarm Data Type	Output corresponds to the Win32 VARTYPE data type.*

*Values for this data type correspond to the VARENUM enumeration, which is documented by Microsoft/MSDN at **VarEnum Enumeration**.

Events Output

The Events Output supports more than one set of records for a given meter.



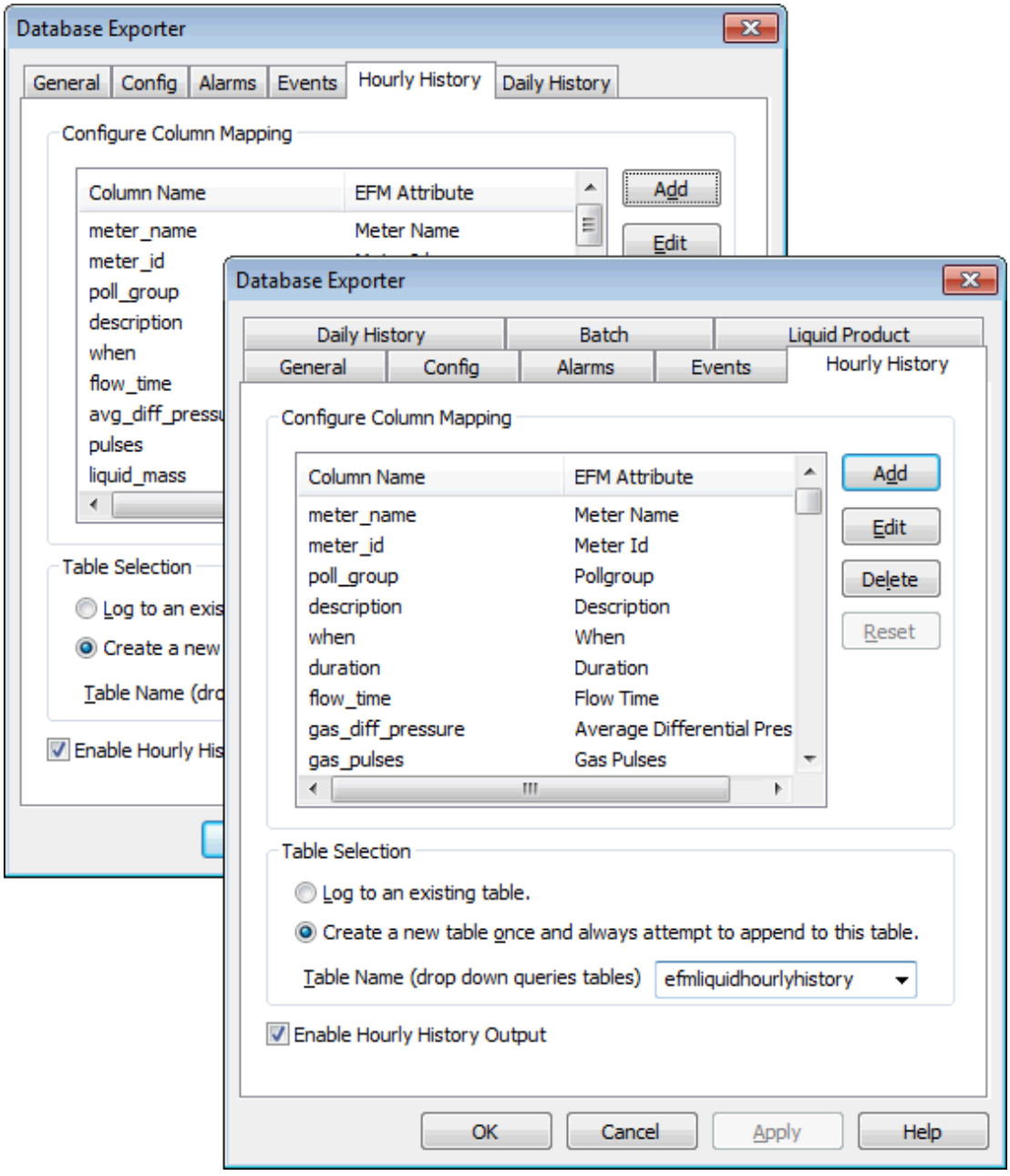
Descriptions of the parameters are as follows:

- **Column Name/EFM Attribute:** This field lists all attributes that are available by default.
  Note: Not all attributes are supported by all EFM-enabled drivers. For more information on supported attributes, refer to the driver's help documentation.
- **Add:** When selected, this button adds an attribute to the record at the bottom of the list. The same attribute can be added to the record more than once. For more information, refer to **Mapping a Database Table Column to an EFM Attribute**.
- **Edit:** When selected, this button is used to edit a selected attribute. For more information, refer to **Mapping a Database Table Column to an EFM Attribute**.
- **Delete:** When selected, this button deletes the selected attribute from the record.
- **Reset:** When selected, this button clears the column mappings. It is only available when the Table Selection is set to Log to an existing table.

- **Table Selection:** This option specifies the table. Options include Log to an existing table and Create a new table once and always attempt to append to this table. The default setting is Create a new table once and always attempt to append to this table.
- **Table Name:** This parameter specifies the table name. The drop-down menu queries existing tables when the Table Selection option is set to Log to an existing table.The default table name is efmgasevents for gas meters and efmliquidevents for liquid meters.
- **Enable Events Output:** When checked, the Events Output is enabled for export. The default setting is checked.

Hourly History Output

The Hourly History Output supports more than one set of records for a given meter. The attribute lists depends on whether the database exporter is for a gas meter or a liquid meter.

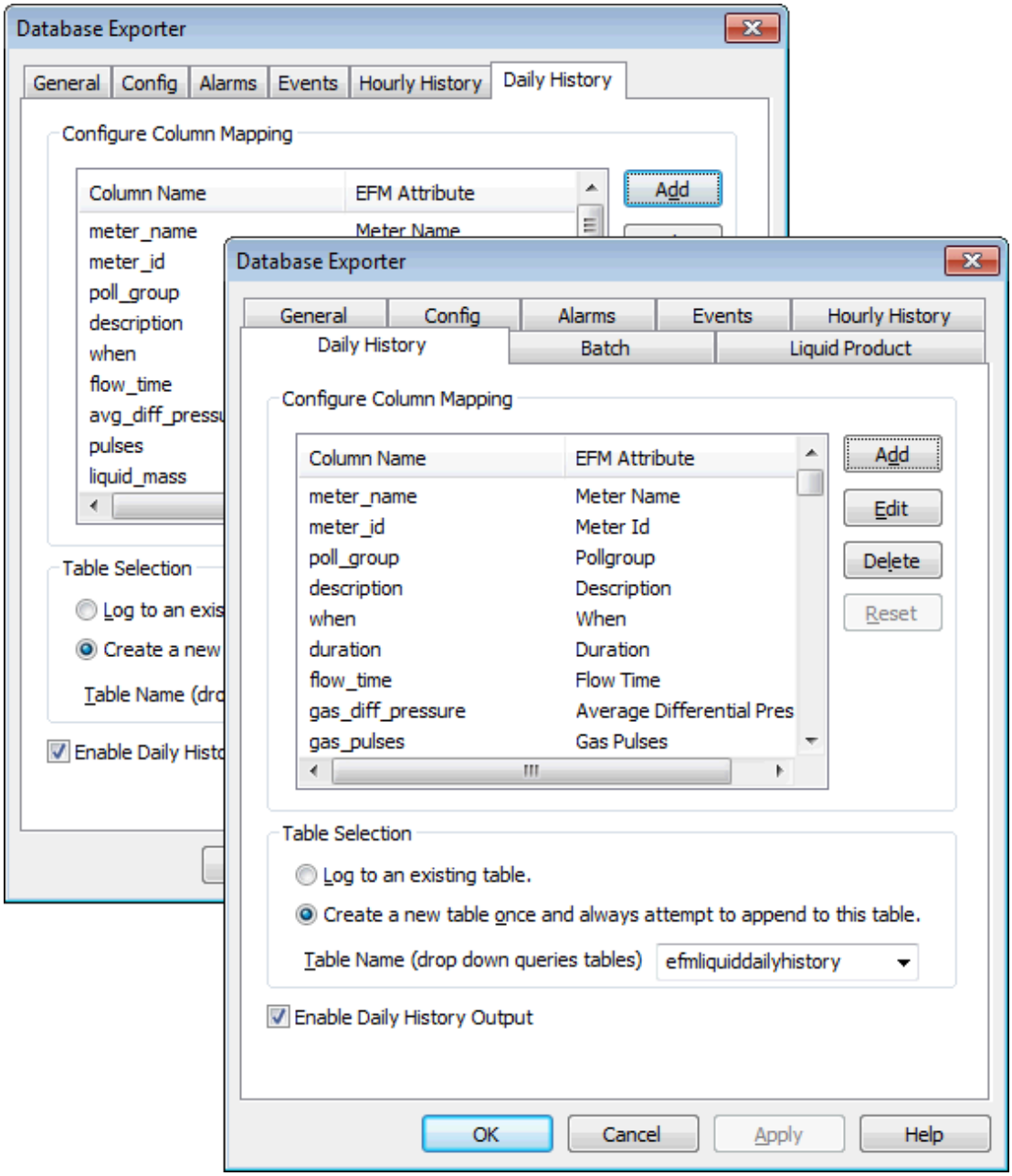


Descriptions of the parameters are as follows:

- **Column Name/EFM Attribute:** This field lists all attributes that are available by default.
  Note: Not all attributes are supported by all EFM-enabled drivers. For more information on supported attributes, refer to the driver's help documentation.
- **Add:** When selected, this button adds an attribute to the record at the bottom of the list. The same attribute can be added to the record more than once. For more information, refer to **Mapping a Database Table Column to an EFM Attribute**.
- **Edit:** When selected, this button is used to edit a selected attribute. For more information, refer to **Mapping a Database Table Column to an EFM Attribute**.
- **Delete:** When selected, this button deletes the selected attribute from the record.
- **Reset:** When selected, this button clears the column mappings. It is only available when the Table Selection is set to Log to an existing table.
- **Table Selection:** This option specifies the table. Options include Log to an existing table and Create a new table once and always attempt to append to this table. The default setting is Create a new table once and always attempt to append to this table.
- **Table Name:** This parameter specifies the table name. The drop-down menu queries existing tables when the Table Selection option is set to Log to an existing table. The default table name is efmgashourlyhistory for gas meters and efmliquidhourlyhistory for liquid meters.
- **Enable Hourly History Output:** When checked, the Hourly History Output is enabled for export. The default setting is checked.

Daily History Output

The Daily History Output supports more than one set of records for a given meter. The attribute lists depends on whether the database exporter is for a gas meter or a liquid meter.



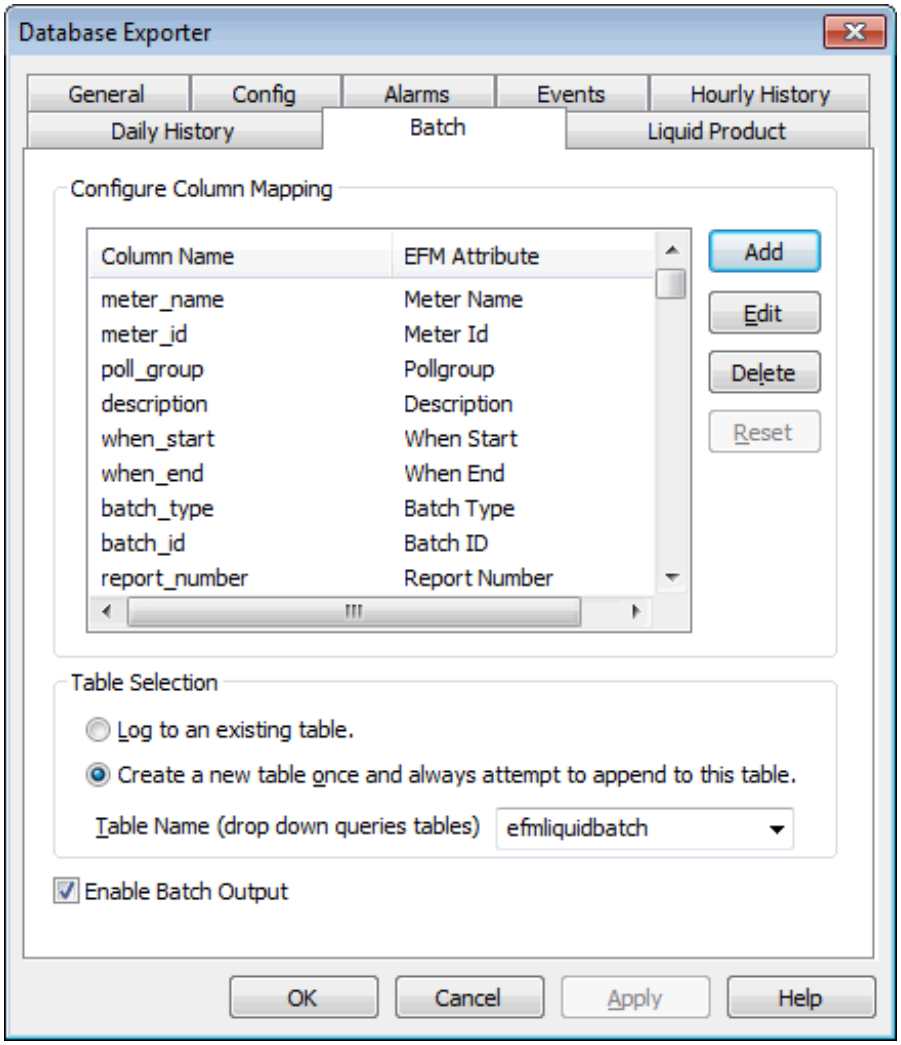
Descriptions of the parameters are as follows:

- **Column Name/EFM Attribute:** This field lists all attributes that are available by default.
  Note: Not all attributes are supported by all EFM-enabled drivers. For more information on supported attributes, refer to the driver's help documentation.
- **Add:** When selected, this button adds an attribute to the record at the bottom of the list. The same attribute can be added to the record more than once. For more information, refer to **Mapping a Database Table Column to an EFM Attribute**.
- **Edit:** When selected, this button is used to edit a selected attribute. For more information, refer to **Mapping a Database Table Column to an EFM Attribute**.
- **Delete:** When selected, this button deletes the selected attribute from the record.
- **Reset:** When selected, this button clears the column mappings. It is only available when the Table Selection is set to Log to an existing table.

- **Table Selection:** This option specifies the table. Options include Log to an existing table and Create a new table once and always attempt to append to this table. The default setting is Create a new table once and always attempt to append to this table.
- **Table Name:** This parameter specifies the table name. The drop-down menu queries existing tables when the Table Selection option is set to Log to an existing table. The default table name is efmgasdailyhistory for gas meters and efmliquiddailyhistory for liquid meters.
- **Enable Daily History Output:** When checked, the Daily History Output is enabled for export. The default setting is checked.

Batch Output

The Batch Output supports more than one set of records for a given liquid meter.



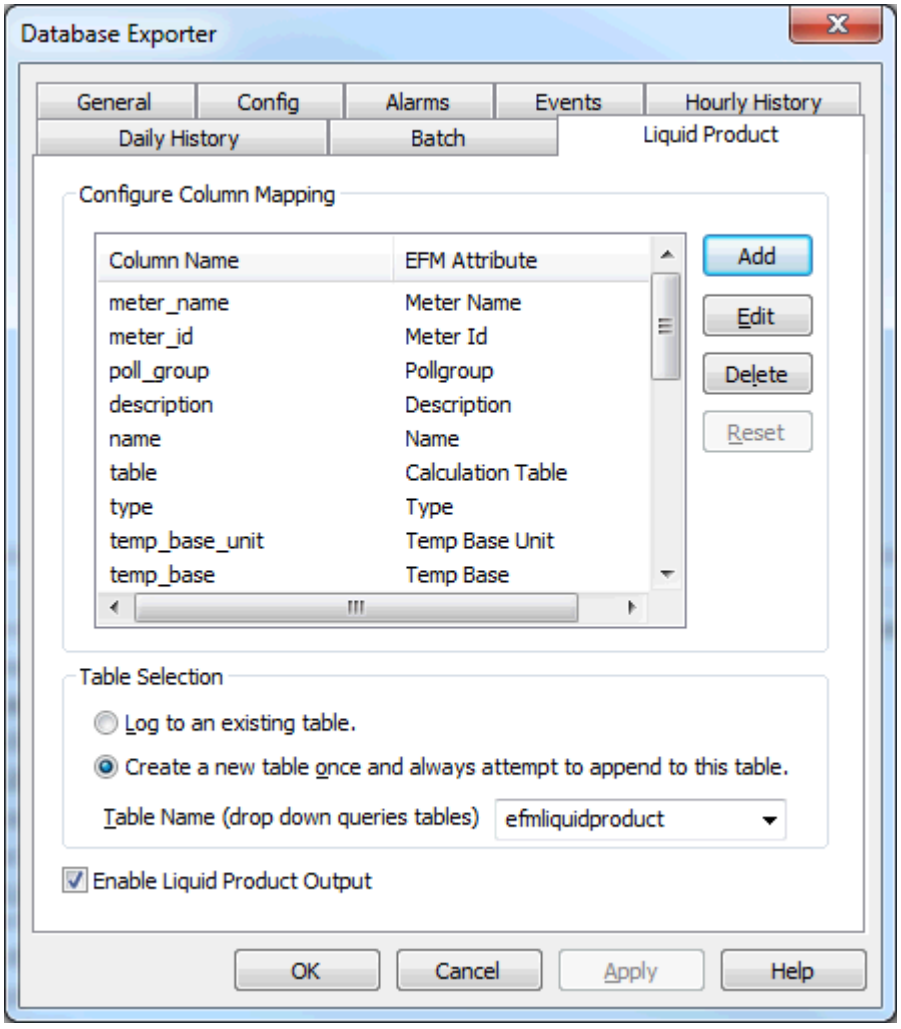
Descriptions of the parameters are as follows:

- **Column Name/EFM Attribute:** This field lists all attributes that are available by default.
  Note: Not all attributes are supported by all EFM-enabled drivers. For more information on supported attributes, refer to the driver's help documentation.

- **Add:** When selected, this button adds an attribute to the record at the bottom of the list. The same attribute can be added to the record more than once. For more information, refer to **Mapping a Database Table Column to an EFM Attribute**.
- **Edit:** When selected, this button is used to edit a selected attribute. For more information, refer to **Mapping a Database Table Column to an EFM Attribute**.
- **Delete:** When selected, this button deletes the selected attribute from the record.
- **Reset:** When selected, this button clears the column mappings. It is only available when the Table Selection is set to Log to an existing table.
- **Table Selection:** This option specifies the table. Options include Log to an existing table and Create a new table once and always attempt to append to this table. The default setting is Create a new table once and always attempt to append to this table.
- **Table Name:** This parameter specifies the table name. The drop-down menu queries existing tables when the Table Selection option is set to Log to an existing table. The default table name is efmliquidbatch.
- **Enable Batch Output:** When checked, the Batch Output is enabled for export. The default setting is checked.

Liquid Product Output

The Liquid Product Output supports more than one set of records for a given liquid meter.

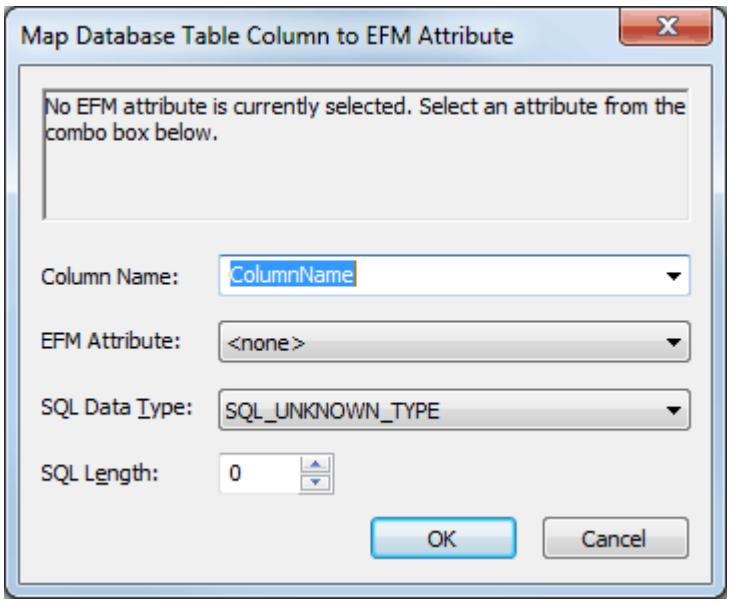


Descriptions of the parameters are as follows:

- **Column Name/EFM Attribute:** This field lists all attributes that are available by default.
  Note: Not all attributes are supported by all EFM-enabled drivers. For more information on supported attributes, refer to the driver's help documentation.
- **Add:** When selected, this button adds an attribute to the record at the bottom of the list. The same attribute can be added to the record more than once. For more information, refer to **Mapping a Database Table Column to an EFM Attribute**.
- **Edit:** When selected, this button is used to edit a selected attribute. For more information, refer to **Mapping a Database Table Column to an EFM Attribute**.
- **Delete:** When selected, this button deletes the selected attribute from the record.
- **Reset:** When selected, this button clears the column mappings. It is only available when the Table Selection is set to Log to an existing table.
- **Table Selection:** This option specifies the table. Options include Log to an existing table and Create a new table once and always attempt to append to this table. The default setting is Create a new table once and always attempt to append to this table.
- **Table Name:** This parameter specifies the table name. The drop-down menu queries existing tables when the Table Selection option is set to Log to an existing table. The default table name is efmliquidproduct.
- **Enable Liquid Product Output:** When checked, the Liquid Product Output is enabled for export. The default setting is checked.

Mapping a Database Table Column to an EFM Attribute

This dialog is used to add or edit an EFM attribute in the record.



Descriptions of the parameters are as follows:

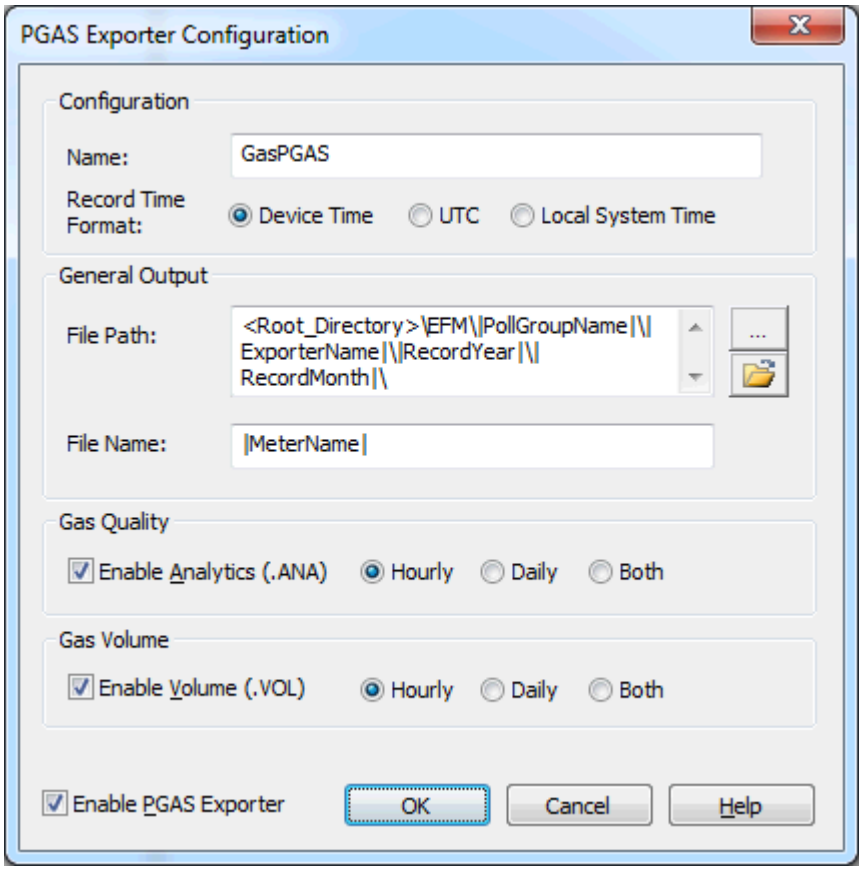
- **Column Name:** This parameter specifies the column name for the new EFM attribute. When the output's Table Selection option is set to Log to an existing table, the Column name drop-down menu queries the selected table for available column names. The default setting is ColumnName.

- **EFM Attribute:** This drop-down menu lists all EFM attributes that are available for selection. An attribute can be mapped to more than one column and appear multiple times in the row of data. An attribute that is specified as <none> is displayed as an empty column. The default setting is <none>.

  Important: Do not attempt to map an EFM attribute to any table column that contains a generated key (such as IDENTITY in MS SQL Server, AUTO_INCREMENT in MySQL, or SERIAL in PostgreSQL).
- **SQL Data Type:** This parameter specifies the EFM attribute's SQL data type. The default setting is SQL_UNKNOWN_TYPE.
- **SQL Length:** This parameter specifies the length of the SQL data Type. It is only enabled when the SQL data Type is SQL_UNKNOWN_TYPE, CHAR, VARCHAR, LONGVARCHAR, WVARCHAR, or WLONGVARCHAR. The valid range is 1 to 255. The default setting is 0.

PGAS Exporter

The PGAS Exporter exports four types of EFM record outputs: Alarms, Events, Analytics, and Volume. Each output contains a unique PGAS extension. The Analytics and Volume outputs may be enabled on a per-type basis.



Descriptions of the parameters are as follows:

- **Name:** This parameter specifies the name of the PGAS Exporter that is being configured. When a new PGAS Exporter is created, this parameter generates a name that is unique across all other exporters. The default setting is "GasPGAS". Each additional exporter that is created has an automatically incremented integer attached to the end of the default name.
  Note: The PGAS Exporter supports file name wildcards.
- **Record Time Format:** This parameter specifies the format of the PGAS records. Options include Device Time, UTC, and Local System Time. The default setting is Device Time. Descriptions of the options are as follows:
  - **Device Time:** When selected, the PGAS time records are the default time of the device.
  - **UTC:** When selected, the PGAS time records are in Coordinated Universal Time (UTC).
  - **Local System Time:** When selected, the PGAS time records are the time of the local system.
- **File Path:** This parameter specifies the location to be used to export data for the PGAS Exporter. A default file path is provided for new exporter configurations. To browse for and select a new file location, click the **Browse** icon. To open the file path without wildcards, click the **Open** icon.
- **File Name:** This parameter specifies the file name. For more information, refer to "Wildcards" below. The default setting is |MeterName|.
  Note: When specifying a file name, users are not required to enter a file extension. An extension that

is provided but does not match the type required by the PGAS Exporter is removed, and the PGAS extension is added. When no extension is provided, the PGAS extension is appended.

- **Enable Analytics (.ANA):** When checked, this option enables the export of PGAS Analytics data. Once enabled, users can specify how often the data is exported. Options include hourly, daily, and both. The default setting is hourly. Descriptions of the options are as follows:
    - **Hourly:** When checked, hourly PGAS Analytics data is exported. The device configuration controls the EFM data in an hourly record.
    - **Daily:** When checked, daily PGAS Analytics data is exported. The device configuration controls the EFM data in a daily record.
    - **Both:** When checked, both hourly and daily PGAS Analytics data is exported.
- **Enable Volume (.VOL):** When checked, this option enables the export of PGAS Volume data. Once enabled, users can specify how often the data is exported. Options include hourly, daily, and both. The default setting is hourly. Descriptions of the options are as follows:
    - **Hourly:** When checked, hourly PGAS Volume data is exported. The device configuration controls the EFM data in an hourly record.
    - **Daily:** When checked, daily PGAS Volume data is exported. The device configuration controls the EFM data in a daily record.
    - **Both:** When checked, both hourly and daily PGAS Volume data is exported.
- **Enable PGAS Exporter:** When checked, this option enables polling in the PGAS Exporter. When unchecked, the PGAS Exporter does not poll. The default setting is checked.

Note: The value that is configured for each output type is stored in the user application profile. Future EFM PGAS Exporter configurations is pre-populated with this information.

See Also:
Wildcards

PGAS Exporter Mappings

For more information on a specific mapping, select a link from the list below.

Alarms (.ARM) Mappings
Gas Quality (.ANA) Mappings
Event (.EVT) Mappings
Gas Volume (.VOL) Mappings

Note: There are several PGAS attributes for which there is no equivalent EFM Exporter configuration mapping.

Alarms (.ARM) Mappings

Plug-In Mapping	PGAS Attribute
Meter ID	METER_ID
When	ALARM_DATE
N/A	PRIORITY_LEVEL
{type+ state+ data_type}	ALARM_TEXT
N/A	TRIGGER_VALUE

Plug-In Mapping	PGAS Attribute
N/A	ALARM_VALUE

Gas Quality (.ANA) Mappings

Plug-In Mapping	PGAS Attribute
Meter ID	ANALYSIS_ID
Sample Time	SAMPLE_DATE
N/A	EFFECTIVE_DATE
N/A	SAMPLE_TYPE
N/A	SAMPLE_ID
<element%>	METHANE_MOL
<element%>	ETHANE_MOL
<element%>	PROPANE_MOL
<element%>	IBUTANE_MOL
<element%>	NBUTANE_MOL
<element%>	IPENTANE_MOL
<element%>	NPENTANE_MOL
<element%>	NHEXANE_MOL
<element%>	NHEPTANE_MOL
<element%>	NOCTANE_MOL
<element%>	NNONANE_MOL
<element%>	NDECANE_MOL
<element%>	N2_MOL
<element%>	CO2_MOL
<element%>	H20_MOL
<element%>	H2S_MOL
<element%>	H2_MOL
<element%>	CO_MOL
<element%>	O2_MOL
<element%>	HE_MOL
<element%>	AR_MOL
Specific Gravity	GRAVITY
Atmospheric Pressure	SAMPLE_PRESSURE_BASE
N/A	DRY_ENERGY_FACTOR
N/A	SAT_ENERGY_FACTOR
BTU	AS_DELIVERED_ENERGY_FACTOR
Average Pressure	SAMPLE_PRESSURE
Average Temperature	SAMPLE _TEMPERATURE
N/A	GENERIC1
N/A	GENERIC2
N/A	GENERIC3
N/A	GENERIC4
N/A	GENERIC5
N/A	GENERIC6

Plug-In Mapping	PGAS Attribute
N/A	GENERIC7
N/A	GENERIC8
N/A	LAB_CODE
N/A	ANALYZED_DATE
N/A	ANALYZER_OPERATOR
N/A	GENERIC9
N/A	GENERIC10
N/A	GENERIC11
N/A	GENERIC12
N/A	GENERIC13
N/A	GENERIC14
N/A	GENERIC15
N/A	GENERIC16
N/A	GENERIC17

Note: The PGAS Exporter attempts to use live gas Quality Control (GC) data for the MOL % gas quality fields. If live data is not available, the EFM Exporter uses the static GC data present in the configuration.

Event (.EVT) Mappings

The PGAS Exporter follows certain conventions to successfully convert configuration events from the EFM Exporter. *For more information, refer to the table below.*

Plug-In Mapping	PGAS Attribute
Meter ID	METER_ID
When	EVENT _DATE
*	METER_CALC_COLUMN_NAME
New Value**	NEW_VALUE
Old Value**	OLD_VALUE
*	PRIORITY_LEVEL*
Attribute Description**	DESCRIPTION
Event Description with values**	COMMENT

*For more information, refer to the table below.
**This column is populated as appropriate information is available.

Mapping .EVT "METER_CALC_COLUMN_NAME" to the PGAS Key Events

This column denotes a key event, which is a special type of event that PGAS is capable of natively understanding.

Plug-In Mapping	PGAS Attribute
Orifice Plate Size	ORIFICE_SIZE
Pipe Diameter	TUBE_DIAMETER
Temperature Base	TEMP_BASE
Pressure Base	CONTRACT_PRES_BASE
N/A	FPV_ENABLE_PRES
Atmospheric Pressure	SITE_ATMOS_PRES

Plug-In Mapping	PGAS Attribute
Factor FR	NORMALIZE_FR_FACTOR
Factor FY	NORMALIZE_Y_FACTOR
Plate Material	PLATE_MATERIAL
Pipe Material	TUBE_MATERIAL
Meter Tap	DIFF_TAP_TYPE
Static Pressure Tap	STAT_TAP_LOCA
DP Calibration Range High	DIFF_HI_RANGE
SP Calibration High	STATIC_HI_RANGE
Temperature Calibration Range Low	TEMP_LO_RANGE
Temperature Calibration Range High	TEMP_HI_RANGE
N/A	ORIFICE_SERIAL_NUM
N/A	IN_SITU
N/A	STATION_STATUS
N/A	METER_STATUS
N/A	STATION_NAME
Meter ID	METER_NAME
N/A	STATION_PURPOSE
N/A	LOC_ADDRESS1
N/A	LOC_ADDRESS2
N/A	LOC_CITY
N/A	LOC_STATE
N/A	LOC_COUNTRY
N/A	LOC_ZIPCODE
N/A	LOC_DISTRICT
N/A	LOC_ELEVATION
N/A	LOC_LATITUDE
N/A	LOC_LONGITUDE
N/A	LOC_MAPCODE
N/A	DISCONNECT_DATE
N/A	INITIAL_FLOW_DATE
N/A	TEST_GROUP_BE
N/A	METER_SERIAL_NUM
N/A	METER_MAKE
N/A	METER_MODEL
Meter Factor	METER_FACTOR
N/A	FIXED_FACTOR_FLAG
N/A	COMPENSATING_INDEX_FLAG
N/A	INDEX_NUMBER_OF_DIALS
N/A	METER_INSTALLATION_DATE
N/A	METER_PURCHASE_DATE
N/A	INDEX_INSTRUMENT_UNIT_OF_DIALS
N/A	EFM_SERIAL_NUMBER
N/A	EFM_MAKE

Plug-In Mapping	PGAS Attribute
N/A	EFM_MODEL
N/A	INSTRUMENT_PURCHASE_DATE
N/A	INSTRUMENT_INSTALLATION_DATE

Gas Volume (.VOL) Mappings

Plug-In Mapping	PGAS Attribute
Meter ID	METER_ID
N/A	PRODUCTION_ DATE_START
When	PRODUCTION_DATE_END
Flow Time	FLOW_TIME_MINUTES
Total Volume	EFM_VOLUME
Total Energy	EFM_ENERGY
Average Extension	FLOW_EXTN
Average Different Pressure	DIFF_PRESS
Average Pressure	STAT_PRESS
Average Temperature	FLOW_TEMP
Raw Volume	ROTARY_CURR_UNCO_VOL
N/A	ROTARY_PREV_UNCO_VOL
Pulses	ROTARY_AVG_FREQ
C Prime	C_PRIME
N/A	FA
N/A	FB
N/A	FG
N/A	FPB
N/A	FPM
N/A	FPV
N/A	FR
N/A	FTB
N/A	FTF
N/A	Y
N/A	F_MASS
N/A	C_D_FT
N/A	RHO_T_P
N/A	RHO_B_GAS
Average N2	EFM_N2_MOL
Average CO2	EFM_CO2_MOL
Average Specific Gravity	EFM_GRAVITY
Average BTU	EFM_ENERGY_FACTOR
N/A	DP_MAN_OVR
N/A	DP_LO_ALM
N/A	DP_HI_ALM
N/A	DP_TX_FAIL
N/A	SP_MAN_OVER

Plug-In Mapping	PGAS Attribute
N/A	SP_LO_ALM
N/A	SP_HI_ALM
N/A	SP_TX_FAIL
N/A	TEMP_MAN_OVR
N/A	TEMP_LO_ALM
N/A	TEMP_HI_ALM
N/A	TEMP_TX_FAIL
N/A	VOL_MAN_OVR
N/A	VOL_LO_ALM
N/A	VOL_HI_ALM
N/A	VOL_TX_FAIL
N/A	INTEG_DIFF_PRESS
N/A	INTEG_STAT_PRESS
N/A	COMMENT
Pressure Base	EFM_PRESSURE_BASE
N/A	BACK FLOW
N/A	LITHIUM_ALARM_FLAG
N/A	BATTERY_VOLTAGE
Average C1	AVG_METHANE
Average C2	AVG_ETHANE
Average C3	AVG_PROPANE
Average H2O	AVG_H2O
Average H2S	AVG_H2S
Average H2	AVG_H2
Average CO	AVG_CO
Average O2	AVG_O2
Average ISOC4	AVG_IBUTANE
Average NC4	AVG_NBUTANE
Average ISOC5	AVG_IPENTANE
Average NC5	AVG_NPENTANE
Average C6	AVG_NHEXANE
Average C7	AVG_NHEPTANE
Average C8	AVG_NOCTANE
Average C9	AVG_NNONANE
Average C10	AVG_NDECANE
Average H2	AVG_HELIUM
Average AR	AVG_ARGON

Wildcards

The file path and file name support both record and server wildcards. Record wildcards are replaced with data from the records. Server wildcards are replaced with data from the server. For more information, refer to the tables below.

Record Wildcards

Wildcard	Description
RecordYear	Replaced by the record year (yyyy).
RecordMonth	Replaced by the record month (mm).
RecordDay	Replaced by the record day (dd).
RecordHour	Replaced by the record hour (hh).
RecordMinute	Replaced by the record minute (mm).

Note: The meter's contract hour is factored into the record wildcards, allowing file organization per contract hour. For example, a contract hour of 9:00 that is used with the file "C:\|RecordDay|\myfile.xxx" organizes files by day (where xxx file extensions are .ana for PGA, .cfx for FlowCal, and .csv for CSV). Each day contains data from 9:00 AM to 9:00 AM. Furthermore, the meter's hourly record span (leading/trailing or data preceding/following) controls how the contract hour is interpreted. If leading, the first record is from 9:00 to 9:59. If trailing, the first record is from 8:01 to 9:00.

Server Wildcards

Wildcard	Description
Meter	The meter component of the full meter name, as displayed in the Detail View.
MeterID	The meter identification associated with the physical meter. If the meter ID is not available or unmapped in the driver, the wildcard is replaced by <Channel>_<Device>_<Meter>_NoMeterID.
Channel	The channel component of the full meter name, as displayed in the Detail View.
Device	The device component of the full meter name, as displayed in the Detail View.
MeterName	The full name of the meter, as displayed in the Detail View.
SQ	A sequence number that increments on each poll.
PollGroupName	The name of the poll group.
ExporterName	The name of the exporter.
SystemYear	Replaced by the local system year.
SystemMonth	Replaced by the local system month.
SystemDay	Replaced by the local system day.
SystemHour	Replaced by the local system hour.
SystemMinute	Replaced by the local system minute.

Caution: When using wildcards, ensure the wildcard constructed paths and file names are specific to the individual meters being polled; wildcard replacement values can be common to many meters, and generic paths could result in files being overwritten.

Attribute Enumerations

Data Type Enumerations

EFM Event and Alarm records contain an enumerated data type attribute. The following table documents the alarm and event enumeration supported by the CSV and database exporters.

data_type	Value
None	0
Short	2
Long	3
Real	4
Double	5
String	8
Boolean	11
Char	16
Byte	17
Word	18
DWord	19

Configuration Attribute Enumerations

There are several EFM configuration parameters that the EFM exporter represents as enumerated values. The following tables document the configuration enumerations supported by the gas CSV and database exporters.

meter_type	Value
Orifice	1
Positive Displacement	2
Turbine	3
Ultrasonic	4
Liquids	5
Vcone	6
Coriolis	7
Line Pack	8

live_analysis	Value
TRUE	1
FALSE	0

live_btu	Value
TRUE	1
FALSE	0

live_gravity	Value
TRUE	1
FALSE	0

live_temp	Value
TRUE	1
FALSE	0

calculation_method	Value
Aga3 1985	1
Aga3 1992	2
Aga5	3
Aga7	4
Vcone4	5
Aga11	6
Line Pack	7

meter_tap	Value
Flange	1
Pipe	2

static_pressure_tap	Value
Up	1
Down	2

unit	Value
English	1
Metric	2

hourly_record_span	Value
Leading	1
Trailing	2

btu_base	Value
Wet	1
Dry	2
As Delivered	3

factor_fa	Value
TRUE	1
FALSE	0

factor_fb	Value
TRUE	1
FALSE	0

factor_fg	Value
TRUE	1

factor_fg	Value
FALSE	0

factor_fpv	Value
TRUE	1
FALSE	0

factor_fr	Value
TRUE	1
FALSE	0

factor_ft	Value
TRUE	1
FALSE	0

factor_fwv	Value
TRUE	1
FALSE	0

pipe_material	Value
Stainless Steel	1
Carbon Steel	2
Monel	3

plate_material	Value
Stainless Steel	1
Carbon Steel	2
Monel	3

fpv_method	Value
Nx19	1
Aga8 Detail	2
Aga8 Gross1	3
Aga8 Gross2	4

static_pressure_type	Value
Gauge	1
Absolute	2

unit_volume	Value
Million Cubic Meters	1
Thousand Cubic Meters	2
Hundred Cubic Meters	3
Cubic Meters	4

unit_volume	Value
Million Cubic Feet	5
Thousand Cubic Feet	6
Hundred Cubic Feet	7
Cubic Feet	8

unit_k_factor	Value
Counts Per Million Cubic Meters	1
Counts Per Thousand Cubic Meters	2
Counts Per Hundred Cubic Meters	3
Counts Per Cubic Meter	4
Counts Per Million Cubic Feet	5
Counts Per Thousand Cubic Feet	6
Counts Per Hundred Cubic Feet	7
Counts Per Cubic Foot	8

Event Attribute Enumerations

The EFM exporter represents configuration change events by associating an event record with a configuration attribute. The following table documents the attribute enumerations supported by the CSV and database exporters.

Note: If the attribute field is empty, then the event record contains a "new_value" string that describes the user event. These event types cannot be associated with a configuration attribute by an EFM driver.

Attribute	Value
Meter ID	0
Meter Type	1
Pressure Base	2
Temp Base	3
Live Analysis	4
Live BTU	5
Live Gravity	6
Live Temp	7
Calculation Method	8
Pipe Diameter	9
Pipe Ref Temp	10
Meter Tap	11
Static Pressure Tap	12
Unit	13
Orifice Plate Size	14
Orifice Ref Temp	15
DP Low Flow Cutoff	16
Atmospheric Pressure	17

Attribute	Value
BTU	18
Specific Gravity	19
Viscosity	20
CO2	21
N2	22
C1	23
C2	24
C3	25
ISOC4	26
NC4	27
ISOC5	28
C5	29
NEOC5	30
C6	31
C7	32
C8	33
C9	34
C10	35
O2	36
H2O	37
H2S	38
HE	39
H2	40
CO	41
AR	42
Hourly Record Span	43
Contract Hour	44
Contract Day	45
Sample Time	46
Time Zone	47
DST	48
BTU Base	49
Factor FA	50
Factor FB	51
Factor FG	52
Factor FPV	53
Factor FR	54
Factor FT	55
Factor FWV	56
Factor FY	57
Fixed Factor	58
Pipe Material	59
Plate Material	60

Attribute	Value
FPV Method	61
Static Pressure Type	62
DP Calib Range High	63
DP Transd Range High	64
SP Calib High	65
SP Calib Low	66
SP Transd Range High	67
Temp Calib Range High	68
Temp Calib Range Low	69
Temp Transd Range High	70
Temp Transd Range Low	71
DP Low Alarm	72
DP Backflow Alarm	73
DP High Alarm	74
SP Low Alarm	75
SP High Alarm	76
Temp Low Alarm	77
Temp High Alarm	78
K Factor	79
Meter Factor	80
Accumulated Volume	81
Unit Volume	82
Unit K Factor	83
Specific Heats	85

Alarm Attribute Enumerations

There are several EFM alarm parameters that the EFM Exporter represents as enumerated values. The following tables document the alarm enumerations supported by the CSV and database exporters.

type	Value
Diff Pressure	1
Static Pressure	2
Temperature	3
Cutoff	4
Backflow	5
Battery	6

State	Value
Off	1
On	2
Hi	3
Lo	4

CSV Import/Export

The EFM Exporter supports the import and export of data in a Comma Separated Variable (CSV) file. CSV import and export supports the efficient configuration of large numbers of poll groups, meters, and exporters. CSV functions are only available at the poll group object level. Parameters that are not defined in the CSV file are assigned appropriate default values. For more information on a specific aspect of CSV Import/Export, select a link from the list below.

Creating a Template

The easiest way to create an import CSV file is to create a template. For more information, refer to the instructions below.

1. To start, create a poll Group. Specify the desired configuration and polling settings, and then click **OK**.
2. Next, right-click on **Meters** and then select **New Meter**.
3. In **Meter**, click the browse icon to locate and select a meter. Then, click **Apply** | **OK**.
4. Next, right-click on **Exporters** and create a new exporter of choice. Once finished, click **OK**.
5. Right-click on **PollGroup** and select **Export CSV**. Save it as a CSV file.
6. Use this template in a spreadsheet application that supports CSV files, and then modify the file as desired.

Note: Microsoft Excel is an excellent tool for editing large groups of tags outside the server. Once a template CSV file has been exported, it can be loaded directly into Excel for editing.

Exporting Poll Group Objects

Exporting a poll Group generates a CSV text file that contains one section for meters and multiple sections for each exporter type. Each section contains a heading record followed by a record for each item defined under the poll Group. Column names must match those listed; however, columns may be in any order.

Meter Fields

The required columns are listed in **bold**.

Column Name	Value
Alarms	This is true if Alarms should be requested for the meter. The default setting is true.
Batch	This is true if Batch History should be collected for the meter. The default setting is true. This only applies to liquid meters.
Enabled	This is true if the meter is enabled, but false otherwise. No data is gathered for disabled meters. The default setting is true.
Events	This is true if Events should be requested for the meter. The default setting is true.
History Daily	This is true if Daily History should be collected for the meter. The default setting is true.
History Hourly	This is true if Hourly History should be collected for the meter. The default setting is true.
Meter	This is the address for the meter inside the server. It includes the channel and device name,

Column Name	Value
	as well as the meter name. For example, "Channel1.Device1.Meter1".
Name	This is the meter's internal server name. It should start with "Meters" and is usually the meter address with all periods replaced with underscores. If left blank, the name is automatically generated based on the meter column.
Record Type	"Meter"

Flow-Cal (CFX) Exporter Fields
The required columns are listed in **bold**.

Column Name	Value
Enabled	This is the enabled state of the exporter. When disabled, the exporter does not generate CFX files. The default setting is true.
File Name	This is the name for CFX files. Wildcards can be used. The default setting is |MeterName|.
History Interval	This is the type of history data to export. Valid options include hourly and daily. The default setting is hourly.
History Type	This is the type of history record to export. Options depend on the type of meter being configured. Valid options include the following: Type 1 (Gas - Basic) Type 2 (Gas - NX19/G1/G2) Type 3 (Gas - Analysis) Type 4 (Gas - Exotic) Type 11 (Liquid - Basic) Type 12 (Liquid - Detail) Type 13 (Liquid - Analysis) The default setting for Gas Data is Type 1 (Gas - Basic). The default setting for Liquid Data is Type 12 (Liquid - Detail).
Name	This is the fully qualified name of the exporter. If the exporter name is not set by the user, the default setting is "Gas Meters.Exporters.GasFlowCal" for gas and "Liquid Meters.Exporters.LiquidFlowCal" for liquid.
Record Type	"FlowCal"
Root Directory	This is the Root Directory or file path for CFX files. Wildcards can be used. The default setting is the user's documents directory.

Flow-Cal Transaction Queue Exporter Fields
The required columns are listed in **bold**.

Column Name	Value
Name	This is the fully qualified name of the exporter. If the exporter name is not set by the user, the default setting is "Gas Meters.Exporters.GasFlowCalTXQ."
DSN	This is the connection for the database (data source name).
Enabled	This is the enabled state of the exporter. When disabled (false), the exporter does not export to the database. The default setting is true.

Column Name	Value
History Interval	This is the type of history data to export. Valid options include hourly and daily. The default setting is hourly.
Password	This is the encrypted password for the DSN; only necessary if the data source requires it.
Record Type	"FlowCalTXQ"
User Name	This is the user name for the DSN; only necessary if the data source requires it.

CSV Exporter Fields

The required columns are listed in **bold**.

Column Name	Value
Alarms EFM Mapping	This is the EFM Mapping for the CSV exporter's Alarms Output. It is read only and cannot be edited.
Alarms Enabled	This is the enabled state of the Alarms Output. When disabled, the output does not poll. The default setting is true.
Alarms Filename	This is the name of the Alarm Output record. The default setting is "Alarms.csv".
Alarms Root Directory	This is the Alarms Output's file path.
Character Encoding	This affects the text that is generated on one computer or system and consumed on another computer or system. Valid options include UTF-8 and ANSI. The default setting is UTF-8.
Configuration EFM Mapping	This is the EFM Mapping for the CSV exporter's Config Output. It is read only and cannot be edited.
Configuration Enabled	This is the enabled state of the Config Output. When disabled, the output does not poll. The default setting is true.
Configuration Filename	This is the name of the Config Output record. The default setting is "Config.csv".
Configuration Root Directory	This is the Config Output's file path.
Enabled	This is the enabled state of the exporter. When disabled, the exporter does not generate CSV files. The default setting is true.
Events EFM Mapping	This is the EFM Mapping for the CSV exporter's Events Output. It is read only and cannot be edited.
Events Enabled	This is the enabled state of the Events Output. When disabled, the output does not poll. The default setting is true.
Events Filename	This is the name of the Events Output record. The default setting is "Events.csv".
Events Root Directory	This is the Events Output's file path.
Delimiter	This is the separator character used in writing. Valid options include comma and semi-colon. The default setting is comma.
History Daily Enabled	This is the enabled state of the Daily History Output. When disabled, the output does not poll. The default setting is true.
History Daily	This is the name of the Daily History Output record. The default setting is

Column Name	Value
Filename	"DailyHistory.csv".
History Daily Root Directory	This is the Daily History Output's file path.
History EFM Mapping	This is the EFM Mapping for the CSV exporter's History Output. It is read only and cannot be edited.
History Hourly Enabled	This is the enabled state of the Hourly History Output. When disabled, the output does not poll. The default setting is true.
History Hourly Filename	This is the name of the Hourly History Output record. The default setting is "HourlyHistory.csv".
History Hourly Root Directory	This is the Hourly History Output's file path.
Batch EFM Mapping	This is the EFM Mapping for the CSV Exporter's Batch Output. It is read only and cannot be edited. Only supported for liquid CSV data.
Batch Enabled	This is the enabled state of the batch Output. When disabled, the output does not poll. The default setting is true (enabled). Only supported for liquid CSV data.
Batch File Name	This is the name of the batch Output record for liquid CSV data. The default setting is "Batch.csv".
Batch Root Directory	This is the liquid CSV batch Output file path.
Liquid Product EFM Mapping	This is the EFM Mapping for the CSV exporter Liquid Product Output. It is read only and cannot be edited. Only supported for liquid CSV data.
Liquid Product Enabled	This is the enabled state of the Liquid Product Output. When disabled, the output does not poll. The default setting is true (enabled). Only supported for liquid CSV data.
Liquid Product File Name	This is the name of the Liquid Product Output record. The default setting is "LiquidProduct.csv". Only supported for liquid CSV data.
Liquid Product Root Directory	This is the Liquid Product Output CSV file path.
Name	This is the fully qualified name of the exporter. If the exporter name is not set by the user, the default setting is "Gas Meters.Exporters.GasCSV" for a gas exporter and "Liquid Meters.Exporters.LiquidCSV" for a liquid exporter.
Record Type	"CSV"
Time Basis	This is the format of the EFM time records. Valid options include the following: Device Time UTC Local System Time The default setting is Device Time.
Time Format	This modifies the output file's time Format. Wildcards include MM, DD, YYYY, hh, mm, ss, and AMPM. The default setting is MM-DD-YYYY hh:mm:ss.

PGAS Exporter Fields

The required columns are listed in **bold**.

Column Name	Value
Enabled	This is the enabled state of the exporter. When disabled, the exporter does not generate PGAS files. The default setting is true.

Column Name	Value
Filename	This is the name for PGAS files. Wildcards can be used. The default setting is |MeterName|.
Gas Quality (.ANA) Enabled	This enables the export of PGAS Analytics data.
Gas Quality (.ANA) History Type	This is how often the gas Quality data is exported. Valid options include: Hourly Daily Both The default setting is hourly.
Gas Volume (.VOL) Enabled	This enables the export of PGAS Volume data.
Gas Volume (.VOL) History Type	This is how often the gas Volume data is exported. Valid options include: Hourly Daily Both The default setting is hourly.
Name	This is the fully qualified name of the exporter. If the exporter name is not set by the user, the default setting is "Gas Meters.Exporters.GasPGAS."
Record Type	"PGAS"
Root Directory	This is the Root Directory or file path for PGAS files. Wildcards can be used. The default setting is the user's documents directory.
Time Basis	This is the format of the PGAS records. Valid options include the following: Device Time UTC Local System Time The default setting is Device Time.

Database Exporter Fields

The required columns are listed in **bold**.

Column Name	Value
Alarms EFM Mapping	This is the EFM Mapping for the database exporter's Alarms Output. It is read only and cannot be edited.
Alarms Enabled	This is the enabled state of the Alarms Output. When disabled, the output does not poll. The default setting is true.
Alarms Table Generation Type	This is the Alarms Output's table type. Valid options include Log to an existing table and Create a new table once and always attempt to append to this table. The default setting is Create a new table once and always attempt to append to this table.
Alarms Table Name	This is the table name of the Alarms Output. The default setting is "efmgasalarms" for gas and “efmliquidalarms” for liquid.
Configuration	This is the EFM Mapping for the database exporter's Config Output. It is read only and

Column Name	Value
EFM Mapping	cannot be edited.
Configuration Enabled	This is the enabled state of the Config Output. When disabled, the output does not poll. The default setting is true.
Configuration Table Generation Type	This is the Config Output's table type. Valid options include Log to an existing table and Create a new table once and always attempt to append to this table. The default setting is Create a new table once and always attempt to append to this table.
Configuration Table Name	This is the table name of the Config Output. The default setting is "efmgasconfig" for gas and “efmliquidconfig” for liquid.
Daily History EFM Mapping	This is the EFM Mapping for the database exporter's Daily History Output. It is read only and cannot be edited.
Daily History Enabled	This is the enabled state of the Daily History Output. When disabled, the output does not poll. The default setting is true.
Daily History Table Generation Type	This is the Daily History Output's table type. Valid options include Log to an existing table and Create a new table once and always attempt to append to this table. The default setting is Create a new table once and always attempt to append to this table.
Daily History Table Name	This is the table name of the Daily History Output. The default setting is "efmgasdailyhistory" for gas and “efmliquiddailyhistory” for liquid.
Description	This is the description of the database exporter.
DSN	This is the DSN for the database.
Enabled	This is the enabled state of the exporter. When disabled, the exporter does not generate database files. The default setting is true.
Events EFM Mapping	This is the EFM Mapping for the database exporter's Events Output. It is read only and cannot be edited.
Events Enabled	This is the enabled state of the Events Output. When disabled, the output does not poll. The default setting is true.
Events Table Generation Type	This is the Events Output's table type. Valid options include Log to an existing table and Create a new table once and always attempt to append to this table. The default setting is Create a new table once and always attempt to append to this table.
Events Table Name	This is the table name of the Events Output. The default setting is "efmgasevents" for gas and “efmliquidevents” for liquid.
Hourly History EFM Mapping	This is the EFM Mapping for the database exporter's Hourly History Output. It is read only and cannot be edited.
Hourly History Enabled	This is the enabled state of the Hourly History Output. When disabled, the output does not poll. The default setting is true.
Hourly History Table Generation Type	This is the Hourly History Output's table type. Valid options include Log to an existing table and Create a new table once and always attempt to append to this table. The default setting is Create a new table once and always attempt to append to this table.
Hourly History Table Name	This is the table name of the Hourly History Output. The default setting is "efmgashourlyhistory" for gas and “efmliquidhourlyhistory” for liquid.
Batch EFM Mapping	This is the EFM Mapping for the database exporter's Batch Output. It is read only and cannot be edited. Only supported for liquid data.
Batch Enabled	This is the enabled state of the Batch Output. When disabled, the output does not poll. The default setting is true (enabled). Only supported for liquid data.

Column Name	Value
Batch Table Generation Type	This is the Batch Output table type. Valid options include Log to an existing table and Create a new table once and always attempt to append to this table (default). Only supported for liquid data.
Batch Table Name	This is the table name of the Batch Output. The default setting is “efmliquidBatch”. Only supported for liquid data.
Liquid Product EFM Mapping	This is the EFM Mapping for the database exporter Liquid Product Output. It is read only and cannot be edited. Only supported for liquid data.
Liquid Product Enabled	This is the enabled state of the Liquid Product Output. When disabled, the output does not poll. The default setting is true (enabled). Only supported for liquid data.
Liquid Product Table Generation Type	This is the Liquid Product Output table type. Valid options include Log to an existing table and Create a new table once and always attempt to append to this table (default). Only supported for liquid database.
Liquid Product Table Name	This is the table name of the Liquid Product Output. The default setting is “efmliquidproduct”. Only supported for liquid data.
Login Timeout	This is how long the server waits for a response when attempting to connect to the DSN. The default setting is 5 seconds.
Name	This is the fully qualified name of the exporter. If the exporter name is not set by the user, the default setting is "Gas Meters.Exporters.GasDatabase" for gas and "Liquid Meters.Exporters.LiquidDatabase" for liquid.
Password	This is the password for the DSN. It is only necessary if the data source requires it.
Record Type	"Database"
Time Basis	This is the format of the EFM time records. Valid options include the following: Device Time UTC Local System Time The default setting is Device Time.
User Name	This is the user name for the DSN. It is only necessary if the data source requires it.

Importing a CSV File into the Server

Once the CSV file has been created and exported, it can be re-imported into the EFM Exporter by clicking **File** | **Import CSV**. This option is only available when a poll Group is selected.

Using Other Characters as the Delimiter

When utilizing a CSV file that does not use a comma or semi-colon delimiter, users should do one of the following:

- Save the project in XML. Then, perform mass configuration on the XML file instead of using CSV.
- Perform a search-and-replace on the delimiter in the CSV file and then replace the delimiter with a comma or semicolon. The delimiter being used by the OPC server (either comma or semicolon) must be set to the replacement character.

Note: For information on specifying which character to use as the variable (comma or semicolon), refer to "Options - General" in the server help file.

System Tags

Poll Group-Level System Tags

Syntax Example: _EFMExporter.<*PollGroup Name*>._Enable

Tag	Class	Description	Access
_Enable	Parameter	The _Enable tag allows the poll group and all child exporter and meter elements to be enabled and disabled. Disabling a poll group terminates polling its meters.	Read/Write
_ ErrorOnLastPoll	Status	The _ErrorOnLastPoll tag is a Boolean tag that reports the status of the previous poll. If an error occurs during a poll, this tag reports TRUE. To obtain the start and end time of the failed poll, read the _LastPollStart and _LastPollEnd tags respectively.	Read Only
_LastPollEnd	Status	The _LastPollEnd tag reports the time that the last poll completed. All times are reported in UTC. If no poll has completed, the tag reports 01/01/1601 00:00:00.000.	Read Only
_LastPollStart	Status	The _LastPollStart tag reports the time that the last poll started. All times are reported in UTC. If no poll has started, the tag reports 01/01/1601 00:00:00.000.	Read Only
_NextPollStart	Status	The _NextPollStart tag reports the time that the next poll starts. All times are reported in UTC. If no next poll is scheduled, the tag reports 01/01/1601 00:00:00.000.	Read Only
_Polling	Status	The _Polling tag is a Boolean tag that reports TRUE whenever a poll is in progress and FALSE otherwise.	Read Only
_Poll	Parameter	The poll tag allows external clients to issue On Demand polls by writing a value to the tag.	Read/Write

Meter-Level System Tags

Example Syntax: _EFMExporter.<*Poll Group Name*>.Gas Meters.<*Meter Name*>._Enable

Tag	Class	Description	Access
_Enable	Parameter	The _Enable tag allows a meter to be enabled and disabled. Meters cannot be enabled while a parent element is disabled. Disabling a meter terminates polling of that meter within a poll group.	Read/Write
_ ErrorOnLastPoll	Status	The _ErrorOnLastPoll tag is a Boolean tag that reports the status of the previous poll. If an error occurs during a poll, this tag reports TRUE.	Read Only
_Polling	Status	The _Polling tag is a Boolean tag that reports TRUE whenever a poll is in progress and FALSE otherwise. A poll is considered finished once its data has been exported.	Read Only
_Poll	Parameter	The poll tag allows external clients to issue On Demand polls by writing a value to the tag. Additionally, multiple meters can be polled simultaneously by writing to the _Poll tag.	Read/Write

Exporter-Level System Tags

Example Syntax: _EFMExporter.<*Poll Group Name*>.Gas Meters.Exporters.<*Exporter*>._Enable

Tag	Class	Description	Access
_Enable	Parameter	The _Enable tag allows an exporter to be enabled and disabled. Exporters cannot be enabled while a parent element is disabled. Disabling a meter terminates polling of that meter within a poll group.	Read/Write

EFM Channel and Device-Level System Tags

The system tags displayed in the table below are supported by all EFM drivers except the EFM Simulator Driver.

Example Syntax: <*Channel Name*>._System._ResetEFMCache
Example Syntax: <*Channel Name*>.<*Device Name*>._System._ResetEFMCache

Tag	Level	Description	Access
_ResetEFMCache	Channel	Writing any non-zero numeric value to the _ResetEFMCache clears the EFM cache and resets the EFM pointer file for each device in the channel. This operation causes the driver to poll all meters for all available EFM data for each flow computer in the channel. The EFM pointer reset and clear cache does not occur until the first meter in each device is polled with the EFM Exporter.	Write Only
_ResetEFMCache	Device	Writing any numeric value to the _ResetEFMCache clears the EFM cache for all of the device's EFM meters and resets the device's EFM pointer file. This operation causes the driver to poll all meters in the flow computer for all available EFM data. The EFM pointer reset and clear cache does not occur until the first meter in the device is polled with the EFM Exporter.	Write Only

Error Descriptions

The following classes of messages may be generated. Click on the link for a list of message in the selected category.

General Error Messages

The following messages may be generated. Click on the link for a description of the message.

Flow-Cal EFM data conversion complete. Legacy cached Flow-Cal EFM files have been moved to <backup directory>.
Flow-Cal EFM data conversion failed. <Extended error>. Exported data will not include previously cached data.
Ignoring enable for <exporter>. The exporter group <exporter group> is disabled.
Ignoring enable for <meter>. The meter group <meter group> is disabled.
Ignoring on demand poll request for <meter>. A poll for this meter is already queued.
Ignoring on demand poll request for <meter>. The meter's group must have at least one enabled exporter and meter must be licensed.
Ignoring on demand poll request for <meter>. The meter is disabled.
Ignoring on demand poll request for <poll group>. A poll is already in progress.
Ignoring on demand poll request for <poll group>. The group has not initialized yet, or one of the meters or exporters is incorrectly configured.
Ignoring on demand poll request for <poll group>. The group is disabled.
Ignoring on demand poll request for <poll group>. The group must have at least one enabled exporter and meter.
Meter <meter> returned bad quality EFM data for [<EFM data that failed>]. This EFM data will not be included in the output.
No new data for meter <meter> exporter <exporter>.
The licensed device count of <device license limit> has been exceeded by <unlicensed device count> device(s).

Attribute look up for the meter_id failed for <meter name>. The |MeterID| wildcard is replaced with <Channel>_<Device>_<Meter>_NoMeterID.

Error Type:
Warning

Source:
Runtime

Possible Cause:
The meter_id attribute is not available or is unmapped in the driver contributing the EFM data.

Solution:
1. Verify the meter_id attribute is available and correctly mapped.
2. Remove occurrences of the |MeterID| wildcard from all file paths and names.

<Error cause> may strand unexported data stored at <Location>. Stranded data will not be exported. Please see help file for more details.

Error Type:
Warning

Source:
Runtime

Possible Cause:
An attempt was made to change the configuration when data had not been successfully exported. Making the configuration change indicated in the error forced the temporary unexported data to be stranded.

Solution:
1. Revert the configuration change indicated in the error.
2. Successfully export the data before re-attempting the configuration change.

<Poll group> ended on demand poll at <time>.

Error Type:
Information

Source:
Runtime

Possible Cause:
An on demand poll that was triggered by a write to the poll group's poll tag has completed.

Solution:
N/A

<Poll group> ended poll at <time>. Next poll scheduled for <time>.

Error Type:
Information

Source:
Runtime

Possible Cause:
A poll has completed and the next poll has been scheduled.

Solution:
N/A

<Poll group> first poll scheduled for <time> local time.

Error Type:
Information

Source:
Runtime

Possible Cause:
A poll group just started and scheduled its first poll.

Solution:
N/A

<Poll group> overran the next scheduled poll at <time>. The next poll has been rescheduled for <time> local time.

Error Type:
Warning

Source:
Runtime

Possible Cause:
The poll took longer to complete than the interval specified in the poll rate.

Solution:

1. Check the poll rate to ensure that data is being requested at a reasonable rate.
2. Check for issues with communications.
3. Ensure that there are not too many meters beneath the poll group. If so, separate the meters among several poll groups.

<Poll group> starting on demand poll at <time>.

Error Type:
Information

Source:
Runtime

Possible Cause:
An on demand poll was triggered by a write to the poll group's poll tag.

Solution:
N/A

<Poll group> starting scheduled poll at <time>.

Error Type:
Information

Source:
Runtime

Possible Cause:
The meters are starting to be polled for EFM data.

Solution:
N/A

Exporter <exporter> failed to append to the existing <file> file. A new file is being created. Data from the existing file will be deleted.

Error Type:

Error

Source:
Runtime

Possible Cause:
The exporter failed to read a file that was previously exported to append new data. The file may have been deleted.

Solution:
Ensure that the file path has proper access permissions, and may be read from by the server.

Exporter <exporter> failed to move meter data from temp directory <temp file> to <output file> (reason: <reason>). The data will stay in the temp directory, and an attempt will be made to move the file after the next poll.

Error Type:
Error

Source:
Runtime

Possible Cause:
1. The output path is not available.
2. The output path does not have proper access permissions.
3. There is not enough disk storage.

Solution:
1. Ensure that the server can access the output path.
2. Ensure that the output path has the proper access permissions to allow the server to create and write to files.
3. Ensure that there is enough disk space to move the file.

Failed to add <EFM data that failed> data for meter <poll group name>.<meter type>.<channel name><device name><meter name>.

Error Type:
Error

Source:
Runtime

Possible Cause:
Data export has been disabled for the meter.

Solution:
Ensure that data export is enabled in the meter.

See Also:
Meter

Failed to add meter <meter> to <poll group>. The meter already exists.

Error Type:
Error

Source:
Configuration

Possible Cause:
An attempt was made to add a meter to a poll group that was already in the poll group.

Solution:
N/A

Failed to load data from <file name>. This data will not be available in future exports.

Error Type:
Warning

Source:
Runtime

Possible Cause:
Flow-Cal EFM data could not be loaded from the specified file during data Store Conversion because the data is corrupt or inaccessible. Data that cannot be converted is not included in future exports.

Solution:
Ensure that permissions have been set correctly for the directory.

Failed to register meters for <poll group name>. Please verify the meter configuration is correct. Polling will not start until the problems are resolved.

Error Type:
Error

Source:
Runtime

Possible Cause:

1. The meter configuration is incorrect, and does not reflect the changes that were recently made to the device.
2. The driver is configured to upload either hourly or daily EFM historical data, but the EFM Exporter is not configured to export that type.
3. Data collection has been disabled for the device.

Solution:

1. Fix the configuration by browsing to the meter or by deleting the offending meter.
2. Ensure that the driver and the EFM Exporter are configured to export the same type of EFM historical data.
3. Ensure that the device's **Enable data collection** option is checked.

Tip:
For more information, refer to "Device Properties - General" in the server help file.

Failed to remove temporary meter data file <file path>. Reason: Configuration change.

Error Type:
Warning

Source:
Runtime

Possible Cause:
The configuration was changed before the output data was consumed.

Solution:
The data is cached in the specified path.

Failed to save EFM data for meter <meter> exporter <exporter> to file <file>. The data is lost.

Error Type:
Error

Source:
Runtime

Possible Cause:

1. The exporter file (such as a CFX file) failed to save to a temporary location. This may be due to access permission issues or limited disk storage.
2. The path name exceeded the length that is allowed by the host system.

Solution:

1. Ensure that the files can be created and written to the file path by the server. Also, ensure that the disk has enough space to store the file.
2. Shorten the channel name, device name, meter name, exporter name, and/or the exporter's path name.

Note:
The Service and Interactive server modes have different permissions.

Failed to save EFM data for meter <meter> exporter <exporter> to file <file>. Reason: Failed to update temporary data store file (unknown).

Error Type:
Error

Source:
Runtime

Possible Cause:
Unsupported characters for the EFM Exporter are being used in the configuration.
Examples of characters that are not supported:
/, @, *, <, >, |, and :.

Solution:
Using the View Selector, navigate to the Channels/Devices view. Rename the Channels, Devices and/or Meters in the project with the unsupported characters.

Flow-Cal EFM data cached from the previously installed version is being converted. All EFM polls will be postponed until the conversion is complete.

Error Type:
Information

Source:
Runtime

Possible Cause:
An application upgrade requires that the Flow-Cal EFM data store be updated for compatibility with the latest version.

Solution:
N/A

Note:
The backup location of the legacy Flow-Cal data store is posted when the conversion completes. When performing a downgrade, users can restore the backup EFM files by renaming the backup file directory from "_EFMBackup" to "_EFM". The backup files are always stored in the server's Application data Folder, which is configured during installation.

Flow-Cal EFM data conversion complete. Legacy cached Flow-Cal EFM files have been moved to <backup directory>.

Error Type:
Information

Source:
Runtime

Possible Cause:

An application upgrade requires that the Flow-Cal EFM data store be updated for compatibility with the latest version. Before conversion, a backup is made and deposited in the specified location. The backup location is specified when a backup is made.

Solution:
N/A

Flow-Cal EFM data conversion failed. <Extended Error>. Exported data will not include previously cached data.

Error Type:
Warning

Source:
Runtime

Possible Cause:
The extended error indicates the cause of the error. When conversion fails, any data that was not previously exported by the EFM Exporter is not be available in future exports.

Solution:
1. Ensure that there is sufficient disk space.
2. Ensure that permissions have been set correctly for the directory.

Ignoring enable for <exporter>. The exporter group <exporter group> is disabled.

Error Type:
Error

Source:
Runtime

Possible Cause:
A client wrote to the exporter's _Enable tag to enable it, but the exporter group was disabled.

Solution:
Enable the exporter group.

Ignoring enable for <meter>. The meter group <meter group> is disabled.

Error Type:
Error

Source:
Runtime

Possible Cause:
A client wrote to the meter's _Enable tag to enable it, but the meter group was disabled.

Solution:
Enable the meter group.

Ignoring on demand poll request for <meter>. A poll for this meter is already queued.

Error Type:
Error

Source:
Runtime

Possible Cause:
A client wrote the meter's _Poll tag when the meter was already queued for a poll. This can occur when the poll tag is written during a scheduled poll or a poll group demand poll.

Solution:
Ensure the client does not attempt to poll a meter twice.

Ignoring on demand poll request for <meter>. The meter is disabled.

Error Type:
Error

Source:
Runtime

Possible Cause:
A client wrote to the meter's _Poll tag while the meter was disabled.

Solution:
Enable the meter to allow polling, poll a different meter, or wait to poll when the meter is enabled.

Ignoring on demand poll request for <meter>. The meter's group must have at least one enabled exporter and the meter must be licensed.

Error Type:
Warning

Source:
Runtime

Possible Cause:

1. Although an on-demand poll was triggered via the meter's poll tag, there are no enabled exporters currently configured.
2. The meter is unlicensed.

Solution:

1. Add or enable meters and/or exporters to the poll group.

2. Verify the license level is adequate for the configured meters. Upgrade the license level or remove meters so that licensed device limit is not exceeded.

Note: A count-based license evaluates the unique devices associated with any meters configured in the EFM Exporter *(see **Licensing the EFM Exporter**)*.

Ignoring on demand poll request for <poll group>. A poll is already in progress.

Error Type:
Warning

Source:
Runtime

Possible Cause:
An on demand poll was triggered via the poll group's poll tag while a poll was already in progress. The on demand poll is ignored.

Solution:
N/A

Ignoring on demand poll request for <poll group>. The group has not initialized yet, or one of the meters or exporters is incorrectly configured.

Error Type:
Warning

Source:
Runtime

Possible Cause:

1. There is an error in the poll group, meter, or exporter configuration that is causing the on demand polls to fail.
2. Data export has been disabled for the meter.

Solution:

1. Check the Event Log for other messages that indicate the cause of the configuration failure. Then, correct the problem.
2. Ensure that data export is enabled in the meter.

See Also: Meter

Ignoring on demand poll request for <poll group>. The group is disabled.

Error Type:
Error

Source:
Runtime

Possible Cause:
A client wrote to the poll group's poll tag to trigger a poll, but the poll group is disabled.

Solution:
Enable the poll group.

Ignoring on demand poll request for <poll group>. The group must have at least one enabled exporter and at least one enabled and licensed meter.

Error Type:
Warning

Source:
Runtime

Possible Cause:
Although an on-demand poll was triggered via the poll group's poll tag, there are no enabled and licensed meters or enabled exporters currently configured.

Solution:

1. Add or enable meters and/or exporters to the poll group.
2. Verify the license level is adequate for the configured meters. Upgrade the license level or remove meters so that licensed device limit is not exceeded.

Note: A count-based license evaluates the unique devices associated with any meters configured in the EFM Exporter *(see **Licensing the EFM Exporter**)*.

Meter <Meter> returned bad quality EFM data for [<EFM data that failed>]. This EFM data will not be included in the output.

Error Type:
Error

Source:
Runtime

Possible Cause:

1. Communications failed with the device.
2. Data collection has been disabled for the device.
3. The device returned bad quality EFM data and is not exported (although the good quality EFM data was exported).
4. The meter in the EFM Exporter is invalid.
5. The configuration has changed so that a meter in the EFM Exporter has no corresponding valid meter in the Channels/Devices view.

Solution:

1. Check the Event Log to see whether the driver has posted any errors or warnings.
2. Ensure that the device's **Enable data collection** option is checked.
3. Once all the mis-configured meter(s) are known, re-browse for the meters in the EFM Exporter and/or re-enter the valid meters in the EFM Exporter. Alternatively, re-initialize the server and look for errors in the event log for messages concerning mis-configured meters.

Notes:

1. There is potential for the loss of records when the [<EFM data that failed>] includes [Configuration]. This can be remedied though a Clear Cache in the EFM driver or by reinitializing the Runtime.
2. For more information, refer to "Device Properties - General" in the server help file.

No new data for meter <meter> exporter <exporter>.

Error Type:
Information

Source:
Runtime

Possible Cause:

1. A poll completed for the meter, but no new record-based data (such as History, Alarm, or Event) was collected. Nothing was exported for the meter.
2. A poll completed for the meter, but no exporter was configured to consume the collected data. For example, this would occur if Hourly History data was collected but there are only exporters configured to consume Daily History.
3. The EFM data for the specified meter contains data from records that are shared between multiple meters. Although the data was uploaded from the device, the server was shutdown before the data could be consumed by the EFM Exporter.

Solution:

1. Check the poll group's poll rate, and ensure that the meter is not being polled too quickly (and that it can store new data).
2. Ensure that the meter has an exporter configured to consume the data.
3. Enable the clear cache option in the device that contains the specified meter. For more information on clearing cached data, refer to the driver's help file.

The licensed device count of <device license limit> has been exceeded by <unlicensed device count> device(s).

Error Type:
Warning

Source:
Runtime

Possible Cause:
A meter was added to a meter group and the addition caused the licensed device limit to be exceeded.

Solution:
- Upgrade the license to a level that supports the appropriate number of unique devices.
- Remove meters until the unique number of devices is below the licensed device limit.

Note:
The count-based license is based on unique devices associated with the meters added to the configuration *(see **Licensing the EFM Exporter**)*.

CSV Exporter Error Messages
The following messages may be generated. Click on the link for a description of the message.

CSV exporter <exporter> failed to output data for meter <meter>. The meter did not provide valid configuration data.
Failed to save EFM data for exporter <exporter> to file <CSV file> (reason: <reason>). The operation is reattempted on the next poll.

CSV exporter <exporter> failed to output data for meter <meter>. The meter did not provide valid configuration data.
Error Type:
Error

Source:
Runtime

Possible Cause:
The reading of the meter's configuration data failed. Configuration data is required.

Solutions:
Check the Event Log to see whether the driver has posted any error messages.

Failed to save EFM data for exporter <exporter> to file <CSV file> (reason: <reason>). The operation will be reattempted on the next poll.
Error Type:
Error

Source:
Runtime

Possible Cause:
Changes were made to the CSV exporter's configuration. The .CSV file on disk has a different column configuration than the .CSV file being exported.

Solution:
Remove the existing .CSV files from the export directory. Then, attempt another poll.

Note:
The number of columns contained in a file that exists in the export directory must match the number of columns in the records that are being exported.

CSV Import / Export Error Messages

The following messages may be generated. Click on the link for a description of the message.

Error importing CSV data. Invalid exporter group path: <path>.

Error Type:
Error

Source:
Configuration

Possible Cause:
The path to the exporter group is invalid or not in the Name field.

Solutions:
Ensure that the path is correct. The path should have the format, "<meter group>.Exporters.<exporter name>".

Error importing CSV data. Invalid meter group name: <meter group>.

Error Type:
Error

Source:
Configuration

Possible Cause:
The meter group name is invalid or not in the Name field.

Solutions:
Ensure that the meter group name is correct. The path should have the format: <meter group name>.Exporters.<exporter name>.

Error importing CSV data. No records found in CSV file.

Error Type:
Error

Source:

Configuration

Possible Cause:
There are no records in the CSV file.

Solutions:
Ensure that the CSV file has at least one valid record or add one.

Error importing CSV tag data. Field buffer overflow reading identification record.

Error Type:
Error

Source:
Configuration

Possible Cause:
One of the field values contains too many characters.

Solutions:
Reduce the number of characters in the CSV field values.

Error importing CSV tag data. Unrecognized field name: <field name>.

Error Type:
Error

Source:
Configuration

Possible Cause:
One of the fields in the CSV record header is invalid.

Solutions:
Ensure that the CSV record headers are valid. Make corrections as necessary.

Error importing tag database. Duplicate field name: <field name>.

Error Type:
Error

Source:
Configuration

Possible Cause:
One of the fields in the CSV record header is duplicated.

Solutions:
Remove the duplicate field name from the CSV header.

Error importing tag database. Missing tag field identification record.

Error Type:
Error

Source:
Configuration

Possible Cause:
The tag field identification record is missing.

Solutions:
Replace or add the tag field identification record.

Database Exporter Error Messages

The following messages may be generated. Click on the link for a description of the message.

Cannot connect to DSN <DSN name> - unable to connect to data source (Memory Exception).

Cannot connect to DSN <DSN name> - unable to connect to data source (Reason: <reason>).

Creation of at least one TIMESTAMP column for table <table name> has been requested. This has been adjusted to the MS-SQL required DATETIME.

Error importing CSV tag record <record number>: login timeout of <value> is out of range. Login timeout set to <value>.

Error importing CSV tag record <record number>: table generation type <type> is not supported. Table generation type set to <type>.

Failed to create table <table name> for unknown reason. SQL query: <query>.

Failed to create table <table name> on DSN <DSN name>. (Reason: <reason>).

Failed to create the data table <table name> - <reason> SQL query: <query>.

Failed to create the data table <table name> (Memory Exception). SQL query: <query>.

Failed to validate table <table name>. (Reason: The configured column name <column name> could not be found).

Table generation is not supported for ODBC driver.

Table validation failed. The table does not exist.

The query failed on DSN <DSN name>, table name <table name> because the data source is not appendable. Please double-check your user permissions.

Unable to open recordset on table <table name> (Memory Exception).

Unable to open recordset on table <table name> (Reason: <reason>).

Unable to retrieve column names on table <table name> because the table does not exist.

Unable to retrieve table column names on table <table name> (Reason: <reason>).

Unable to retrieve table name.

Unable to retrieve table name (Reason <reason>).

Unable to validate table <table name> (Memory Exception).

Cannot connect to DSN <DSN name> - unable to connect to data source (Memory Exception).

Error Type:
Serious

Possible Cause:
The database exporter could not connect to the specified data source because the ODBC Driver encountered a memory exception while opening the table.

Solution:
If the database is on a remote computer, double-check the user permissions and then verify that the network connection is active.

Cannot connect to DSN <DSN name> - unable to connect to data source (Reason: <reason>).

Error Type:
Serious

Possible Cause:
The database exporter could not connect to the specified data source due to the reason specified by the ODBC Driver.

Solution:
Verify the DSN settings and then consult the ODBC Driver's help documentation.

Creation of at least one TIMESTAMP column for table <table name> has been requested. This has been adjusted to the MS-SQL required DATETIME.

Error Type:
Warning

Possible Cause:
The DSN type is Microsoft SQL, which does not support this use of the TIMESTAMP type.

Solution:
The database exporter converts the TIMESTAMP columns to DATETIME columns when creating tables. Users should only map DATETIME columns when using the Microsoft SQL server.

Error importing CSV tag record <record number>: login timeout of <value> is out of range. Login timeout set to <value>.

Error Type:
Warning

Possible Cause:
The specified CSV file record uses a Login Timeout that is out of range.

Solution:
Use a Login Timeout within the valid range of 1 to 99999 seconds.

Error importing CSV tag record <record number>: table generation type <type> is not supported. Table generation type set to <type>.

Error Type:
Warning

Possible Cause:
The specified CSV file record uses a table generation type that is not supported by the database exporter.

Solution:
Use a table generation type that is supported by the database exporter, such as "AutoGenerateOnce" or "UseExisting."

Failed to create table <table name> for unknown reason. SQL query: <query>.

Error Type:
Serious

Possible Cause:
The database exporter could not create the specified table for unknown reasons.

Solution:
The SQL query string is provided for diagnostic reasons. For more information, refer to the ODBC Driver's help documentation.

Failed to create table <table name> on DSN <DSN name>. (Reason: <reason>).

Error Type:
Serious

Possible Cause:
The database exporter could not create the specified table due to the reason specified by the ODBC Driver.

Solution:
Verify the DSN settings and then consult the ODBC Driver's help documentation.

Failed to create the data table <table name> - <reason> SQL query: <query>.

Error Type:
Serious

Possible Cause:
The database exporter could not create the specified table due to the reason specified by the ODBC Driver.

Solution:
The SQL query string is provided for diagnostic reasons. For more information, refer to the ODBC Driver's help documentation.

Failed to create the data table <table name> (Memory Exception). SQL query: <query>.

Error Type:
Serious

Possible Cause:
The database exporter could not create the specified table because the ODBC Driver encountered a memory exception while opening the table.

Solution:
1. The SQL query string is provided for diagnostic reasons. For more information, refer to the ODBC Driver's help documentation.
2. If the database is on a remote computer, double-check the user permissions and then verify that the network connection is active.

Failed to validate table <table name>. (Reason: The configured column name <column name> could not be found).

Error Type:
Serious

Possible Cause:
The database exporter is unable to validate the table because the specified column name could not be found.

Solution:
Verify that the specified column name exists in the table.

Table generation is not supported for ODBC driver.

Error Type:
Serious

Possible Cause:
The specified DSN does not use a supported ODBC driver.

Solution:
Specify a DSN that uses a supported ODBC driver.

Note:
For more information on supported DSNs, refer to **Configure DSN**.

Table validation failed. The table does not exist.

Error Type:
Serious

Possible Cause:
The table specified in the database exporter does not exist.

Solution:
Verify that the tables specified in the database exporter's configuration exist in the DSN.

The query failed on DSN <DSN name>, table name <table name> because the data source is not appendable. Please double-check your user permissions.

Error Type:
Serious

Possible Cause:
The database exporter could not perform a transaction because the data source is not appendable.

Solution:
Use the database software to verify that the user has append permissions on the specified table.

Unable to open recordset on table <table name> (Memory Exception).

Error Type:
Serious

Possible Cause:
The database exporter could not open the recordset on the specified table because the ODBC Driver encountered a memory exception while opening the table.

Solution:
If the database is on a remote computer, double-check the user permissions and then verify that the network connection is active.

Unable to open recordset on table <table name> (Reason: <reason>).

Error Type:
Serious

Possible Cause:
The database exporter could not open the recordset on the specified table due to the reason specified by the ODBC Driver.

Solution:
Verify the DSN settings and then consult the ODBC Driver's help documentation.

Unable to retrieve column names on table <table name> because the table does not exist.

Error Type:
Serious

Possible Cause:
The database exporter is unable to retrieve the column names from the DSN because the table does not exist.

Solution:
Verify that the specified table exists in the DSN.

Unable to retrieve table column names on table <table name> (Reason: <reason>).

Error Type:
Serious

Possible Cause:
The database exporter is unable to retrieve the column names from the DSN due to the reason specified by the ODBC Driver.

Solution:
Verify the DSN settings and then consult the ODBC Driver's help documentation.

Unable to retrieve table names.

Error Type:
Serious

Possible Cause:
The database exporter is unable to retrieve the table names from the DSN.

Solution:
Verify the DSN settings and then consult the ODBC Driver's help documentation.

Unable to retrieve table names (Reason: <reason>).

Error Type:
Serious

Possible Cause:
The database exporter is unable to retrieve the table names from the DSN due to the reason specified by the ODBC Driver.

Solution:
Verify the DSN settings and then consult the ODBC Driver's help documentation.

Unable to validate table <table name> (Memory Exception).

Error Type:
Serious

Possible Cause:
The database exporter is unable to validate the specified table because the ODBC Driver encountered a memory exception while opening the table.

Solution:
If the database is on a remote computer, double-check the user permissions and then verify that the network connection is active.

Unable to validate table <table name> (Reason: <reason>).

Error Type:
Serious

Possible Cause:
The database exporter is unable to validate the specified table due to the reason specified by the ODBC Driver.

Solution:
Verify the DSN settings and then consult the ODBC Driver's help documentation.

Unknown error opening recordset on table <table name>.

Error Type:
Serious

Possible Cause:
The database exporter could not open the recordset on the specified table for an unknown reason.

Solution:
Verify the DSN settings and then consult the ODBC Driver's help documentation.

Flow-Cal Exporter Error Messages

The following messages may be generated. Click on the link for a description of the message.

Flow-Cal exporter <exporter> failed to output data for meter <meter>. The meter did not provide valid configuration data. <Exporter name> is incompatible with the meter group type. Setting the history type to <default history type>.

The exporter <exporter name> is incompatible with the meter group type. The exporter configuration will not be loaded. <Exporter name> is incompatible with the meter group type. Setting the history type to <default history type>.

The history type <history type> for Flow-Cal Exporter <exporter name> is incompatible with the meter group type. Setting the history type to <default history type>.

Flow-Cal exporter <exporter> failed to output data for meter <meter>. The meter did not provide valid configuration data.

Error Type:
Error

Source:
Runtime

Possible Cause:
The reading of the meter's configuration data failed. Configuration data is required.

Solutions:
Check the Event Log to see whether the driver has posted any error messages.

The exporter <exporter name> is incompatible with the meter group type. The exporter configuration will not be loaded.

Error Type:
Warning

Source:
Configuration

Possible Cause:
The XML file contains an exporter configuration that is not valid for the specified meter group.

Solution:
Verify that the XML gas meters or liquid meters groups only contain valid exporters.

The history type <history type> for Flow-Cal exporter <exporter name> is incompatible with the meter group type. Setting the history type to <default history type>.

Error Type:
Warning

Source:
Configuration

Possible Cause:
The XML project file contains a History Type that is not valid for the meter group. For example, an exporter in the gas meters group is configured with a History Type of Type 13.

Solution:
Update the XML file to include a valid History Type.

Flow-Cal Transaction Queue Exporter Error Messages

The following messages may be generated. Click on the link for a description of the message.

Cannot connect to DSN <DSN name> - 'unable to connect to data source (Memory Exception).'

Cannot connect to DSN <DSN name> - 'unable to connect to data source (Reason: <reason>).'

Failed to validate table <table name>. (Reason: The configured column name <column name> could not be found).

Flow-Cal TXQ exporter <exporter name> failed to output data. The specified DSN <DSN name> is not an Oracle DSN.

Table validation failed. The table does not exist.

The query failed on DSN <DSN name>, table name <table name> because the data source is not appendable. Please double-check your user permissions.

Error writing data to DSN <DSN name>, table <table name> (Memory Exception).

Error writing data to DSN <DSN name>, table <table name> (Reason: <reason>).

Cannot connect to DSN <DSN name> - unable to connect to data source (Memory Exception).

Error Type:
Serious

Possible Cause:
The Flow-Cal Transaction Queue Exporter could not connect to the specified data source because the ODBC driver encountered a memory exception opening the table.

Solution:
If the database is on a remote computer, check the user permissions and verify that the network connection is active.

Cannot connect to DSN <DSN name> - unable to connect to data source (Reason: <reason>).

Error Type:
Serious

Possible Cause:
The Flow-Cal Transaction Queue Exporter could not connect to the specified data source for the reason specified by the ODBC driver.

Solution:
Verify the DSN settings and consult the ODBC driver help documentation.

Failed to validate table <table name>. (Reason: The configured column name <column name> could not be found).

Error Type:
Serious

Possible Cause:
The Flow-Cal Transaction Queue Exporter is unable to validate the table because the specified column name cannot be found.

Solution:
Verify that the specified column name exists in the table or correct and try again.

Flow-Cal TXQ exporter <exporter name> failed to output data. The specified DSN <DSN name> is not an Oracle DSN.

Error Type:
Serious

Possible Cause:
The specified DSN is not a valid Oracle DSN.

Solution:

Verify that the exporter is configured to use an Oracle DSN or change the DSN to be a valid Oracle DSN.

Table validation failed. The table does not exist.

Error Type:
Serious

Possible Cause:
A table required by the Flow-Cal Transaction Queue Exporter does not exist.

Solution:
Verify that the tables required by the Flow-Cal Transaction Queue Exporter exist in the DSN. Contact the Flow-Cal Transaction Queue administrator for more information.

The query failed on DSN <DSN name>, table name <table name> because the data source is not appendable. Please double-check your user permissions.

Error Type:
Serious

Possible Cause:
The Flow-Cal Transaction Queue Exporter could not perform a transaction because the data source cannot be appended.

Solution:
Contact your Flow-Cal Transaction Queue administrator to verify that the user has permission to append to the specified table.

Error writing data to DSN <DSN name>, table <table name> (Memory Exception).

Error Type:
Serious

Possible Cause:
The Flow-Cal Transaction Queue Exporter could not open the record set on the specified table because the ODBC driver encountered a memory exception while opening the table.

Solution:
Contact the Flow-Cal Transaction Queue administrator to check the user permissions and, if the database is on a remote computer, verify that the network connection is active.

Error writing data to DSN <DSN name>, table <table name> (Reason: <reason>).

Error Type:
Serious

Possible Cause:
The Flow-Cal Transaction Queue Exporter could not open the record set on the specified table due to the reason specified by the ODBC driver.

Solution:
Verify the DSN settings and consult the ODBC driver help documentation or the Flow-Cal Transaction Queue administrator.

PGAS Exporter Error Messages
The following messages may be generated. Click on the link for a description of the message.

PGAS Exporter Error Messages
PGAS Exporter <exporter> failed to output data for meter <meter>. The meter did not provide valid configuration data

PGAS Exporter <Exporter> failed to output data for meter <meter>. The meter did not provide valid configuration data.
Error Type:
Error

Source:
Runtime

Possible Cause:
The reading of the meter's configuration data failed. Configuration data is required.

Solutions:
Check the Event Log to see whether the driver has posted any error messages.

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