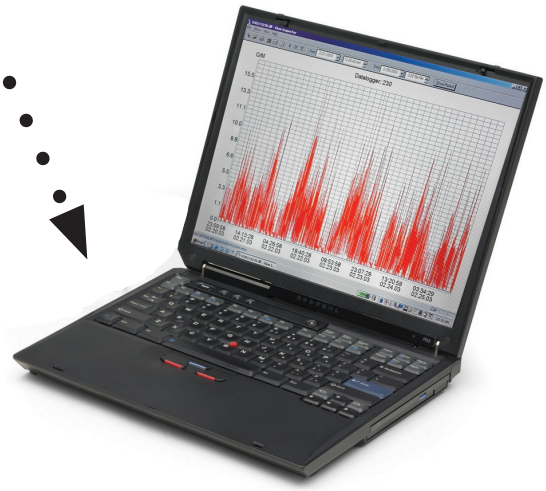
FlowInspector™

Software Guide for Seametrics Data Logger

(Logging Meters, Rate/Total Indicators, and Flanged Magmeters)

Version 3.0



Seametrics

FlowInspector 3.0 software is designed as part of the Seametrics Data Logger systems that include the newer generation magmeters and rate totalizers (AG3000, iMAG 4700, AG90, EX90 or FT400) having a real time clock (RTC). FlowInspector is used to set up the Logger, to download and manage data files, and to analyze and export data.

Hardware/Software Requirements

Use of FlowInspector Version 3.0 requires the following hardware/software:

- DC4-USB
  - 4 pin cable for AG3000/iMAG4700/AG90/EX90 (Meters before 5/6/2020)
- DC5-USB Cable
  - 5 pin cable for AG3000/iMAG4700/AG90/EX90 (Meters after 5/6/2020)
- Seametrics PN 104025 (USB 2.0 cable - 'A' male to Mini -B male) for FT400-series
- PC computer with Windows® 7, Windows® 8, and Windows® 10
- USB connection port

Installation Instructions

IMPORTANT!
Download your copy of FlowInspector software from seametrics.com/Support & Resources/Downloads

1. Close all other programs running on your computer.
2. Download FlowInspector from the Seametrics web site: seametrics.com/Support & Resources/Downloads
3. Run the Setup file. (Depending on your operating system and security settings, you may need admin permission to run the installer.)
4. If you have an earlier copy of FlowInspector on your computer, follow instructions to Uninstall it. Once it has been uninstalled, you will need to run the Setup file again to install.
5. You are given the option of installing just the application or the application and release notes. Make your selection from the dropdown box, and then click Next.
6. At the "Ready to Install" screen, review your selections, use Back to make corrections as necessary. Click Install.
7. At "Completed" screen, click Finish.

After installation is complete, FlowInspector will be stored in the FlowInspector folder in your computer's Start menu.

Flow Inspector Format

When FlowInspector installs, it will load 2 versions of FlowInspector. FlowInspector 2.7 will be visually similar to the older, legacy versions of FlowInspector that operators may be familiar with. Version 2.7 operates like the older versions but any operational issues that could be found in the older versions have been repaired or in some cases removed. FlowInspector 2.7 can be used with any data logger device that does not have a Real Time Clock (RTC)

If you are unsure if you are using the current 2.7 version of FlowInspector, click on the Help tab, 'About FlowInspector' and check the version number.

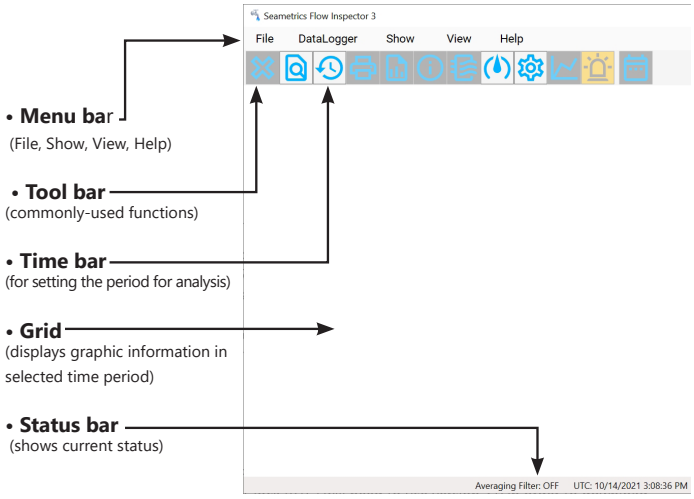
Any data logger with a Real Time Clock (RTC) will need to use version 3.0 in order to download data. Any AG3000, iMAG4700 or AG/EX90 data logger without an RTC can also be downloaded with version 3.0, but RTC data loggers can ONLY be downloaded with version 3.0. (All AG3000, iMAG 4700, and AG/EX90 meters do not currently have a real time clock.)

Users familiar with older, legacy versions of FlowInspector will recognize most of the functions in version 3.0 but they should be easier to access and easier to use.

First-Time Logger Set-Up

The following instructions apply to **first-time set-up only**. Re-setting procedures are the same except that you must first download any data you wish to save.

CAUTION. To prevent data loss, if you are re-setting a Logger that has been previously used, follow the procedure for first time set-up EXCEPT that you must first download any data you wish to save. Any prior data will be erased during set-up.



Open FlowInspector

To open FlowInspector 3.0, double click on the icon on your computer desktop or in the Program/search in your Start menu. The FlowInspector 3.0 Main Screen will open.

Connect Hardware

Connect the round end of your Seametrics data cable to the matching socket on your meter or data logger. Connect the other end of the cable into your computer USB port. If connecting an FT400-127, plug your mini-USB connector into the FT400 and the USB connector into your computer.

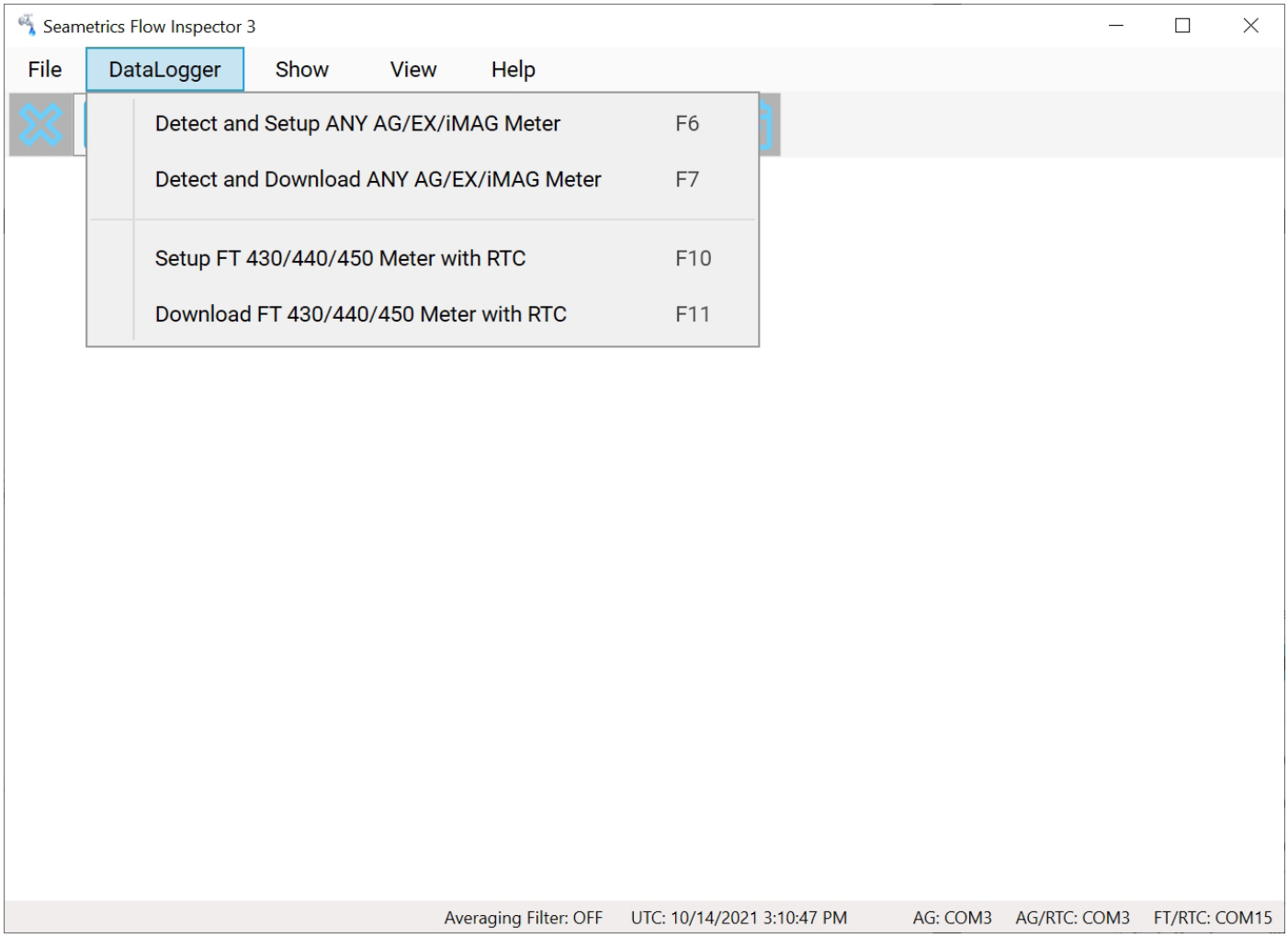
DC4/DC5-USB driver download

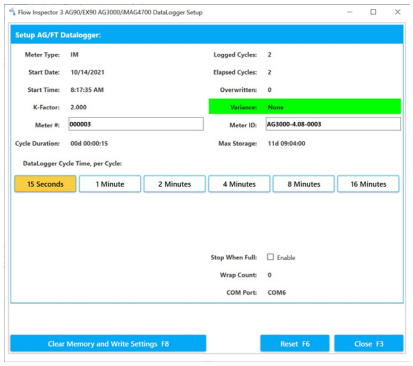
The first time any DC4 or DC5-USB cable is connected to a computer, the drivers for that cable will be downloaded from the internet. You will need an internet connection for this, and the download may take as long as 5 minutes. When the dialog box for 'downloading drivers' pops up on your computer, we recommend clicking on that box and following the progress, not doing so will almost always lead to the user attempting to use the cable before the download completes. If the computer asks for permission to 'find drivers', select that option.

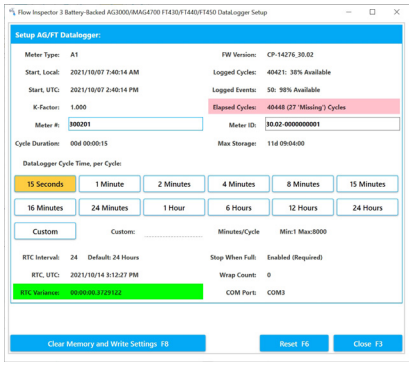
Note: DC4 and DC5 cable drivers available at:
www.ftdichip.com/drivers/d2xx

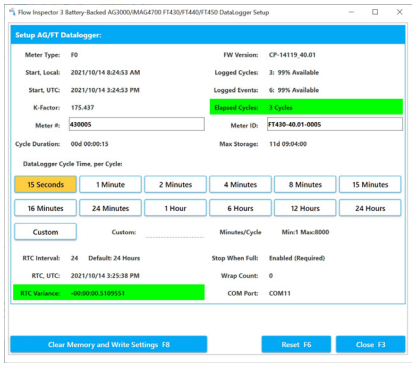
Initialize Logger

With FlowInspector 3.0 open and the data cable connected, click on Datalogger, and then select either Detect and Setup ANY AG/EX/iMAG Meter, or Setup FT430/FT440/FT450 Meter with RTC.









Start Date / Start Time (*All units*)

The date/time that a non-RTC Logger was initialized is based on the real time clock of the computer used, formatted according to its regional date/time conventions (e.g., month/day/year vs. day/month/year and 12-hour vs. 24-hour clock). ***Date and time cannot be changed manually,*** but will be automatically updated when you "write settings" at the end of the set-up procedure. For all RTC data loggers setup using FlowInspector 3.0, the clock is set via the RTC board and references UTC time which is adjusted when initialization is complete.

K-Factor (FT400-127 units)

The K-factor of an FT400-127 will be read from the FT400 and does not need to be manually set in FlowInspector.

Meter Number

The Meter Number you assign here will be included in the Logger file name to differentiate it from other Loggers when you analyze your data. Assign any number you choose, up to six digits.

ID (*All units*)

This is an optional field in which you may enter an alphanumeric string up to 16 characters that will help to easily differentiate one Logger from another during data analysis (e.g., Pump Station 3).

Cycle Time / Storage Time (*All units*)

There is an inverse relationship between the frequency of data collection (cycle time) and maximum capacity (storage time). Shorter cycle times provide a more detailed flow curve but shorten the number of days until the logger memory is full. Longer cycle times give less detailed data over a longer time period. ***Select the cycle time and storage time best suited to your application.***

Cycle Time (in seconds)	Storage Time
15	11 days
60	45 days
120	3 months
240	6 months
480	1 year
960	2 years

AG3000, iMAG 4700, AG/EX90 without RTC

Cycle Time	Storage Time
15	11 days
1 min.	44 days
2 min.	3 months
4 min	6 months
8 min.	1 year
15 min	22 months
16 min	2 years
24 min.	3 years
1 hour	7 years 5 months
6 hour	Lifetime of unit
12 hour	Lifetime of unit
24 hour	Lifetime of unit
Custom (value x 1 min)	44 days x value

AG3000/iMAG 4700/AG90/EX90/ FT430/FT440/FT450 with RTC

Stop When Full (*All units*)

By default, RTC data loggers will always stop when full. When a non-RTC Logger's memory is full, it can either 1) stop recording data, or 2) return to the beginning of the recorded data and begin overwriting the earliest measurement data points. In the first case, the total will stop accumulating until the Logger has been manually cleared and reset. In the second case, the running total will continue to show only the current data while the earlier specific data points are overwritten. ***Choose which condition you prefer by checking or unchecking the "Stop When Full" box.***

WARNING! If Stop When Full is selected you MUST upload the data before the end of the recording cycle.

Clear Memory and Save Settings to Logger

Clicking this button will save your chosen settings and end Setup.

WARNING! Clicking this button will erase all previous data in the Logger and reset the totalizer. Be sure you have downloaded any stored data you wish to preserve before clicking Clear. Click Cancel if you wish to abort the set-up operation without saving settings.

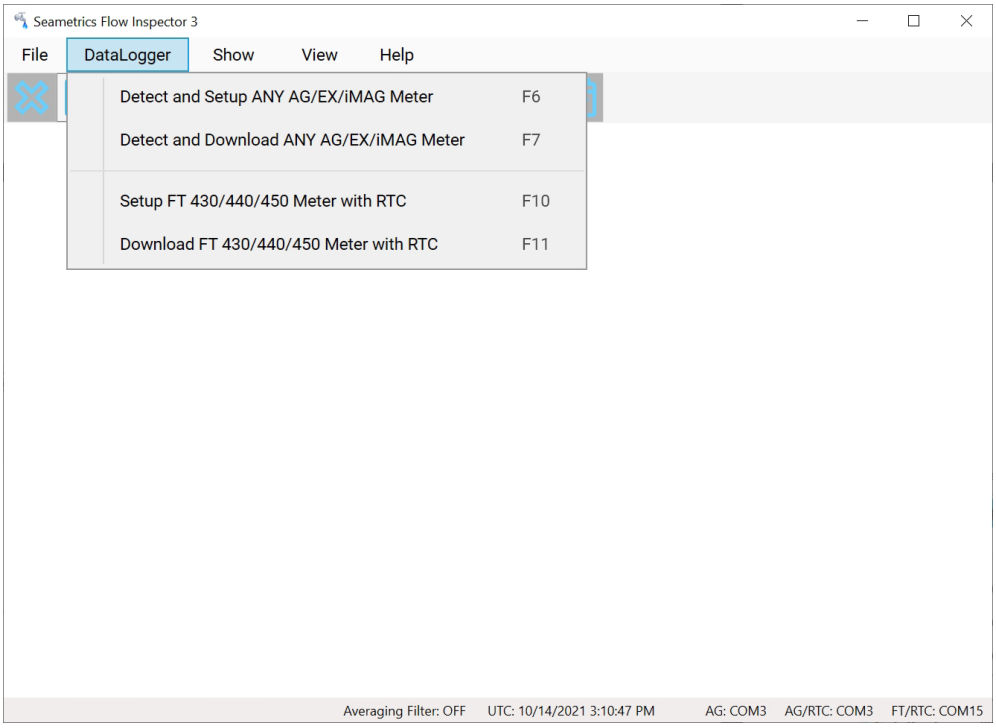
Close

Click this button to exit the screen without saving changes to your Logger settings. Use this button when you have changed your mind about resetting your Logger.

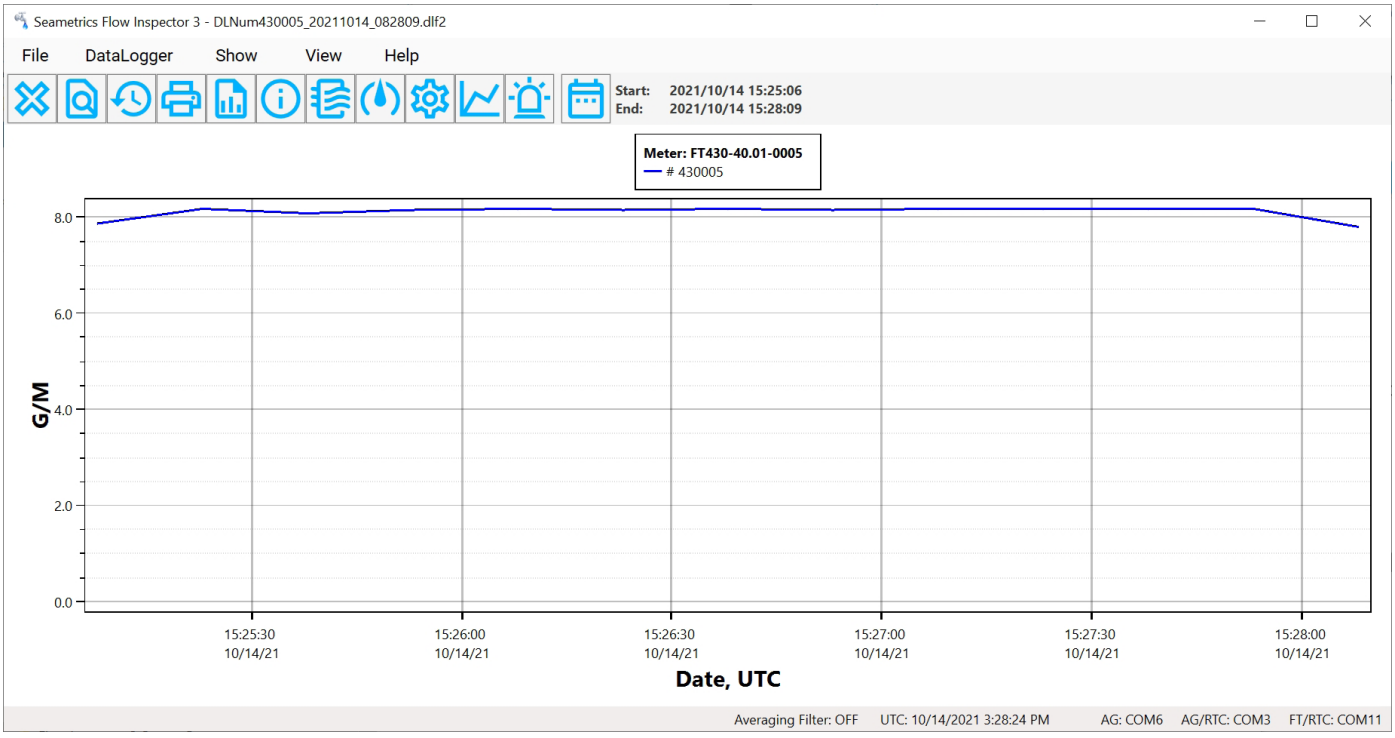
DOWNLOAD DATA

Open FlowInspector 3.0 and ***Connect Hardware*** as described in the Set-Up section. Click on DataLogger, and select Detect and Download ANY AG/EX/iMAG meter, or Download FT430/440/450 meter with RTC. FlowInspector automatically names your file (see Naming Convention, in File Management section.) If you download twice from the same Logger on the same day, you will have a choice of overwriting the first data set or incrementing the file name to save both sets.

Downloading a full memory set of data may take as long as 5-1/2 minutes. Once you initialize a download, do not interrupt it or you may lock up your computer. During any process, use End Task from the Task Manager to stop that process if needed.



When your download is complete, a graph line will appear on the empty grid.



TOOLBAR

All Toolbar Buttons:


Close File


Show Day Report


Settings


Open File


Show File Information


Show Original Graph


Show Recent Files


Average Values

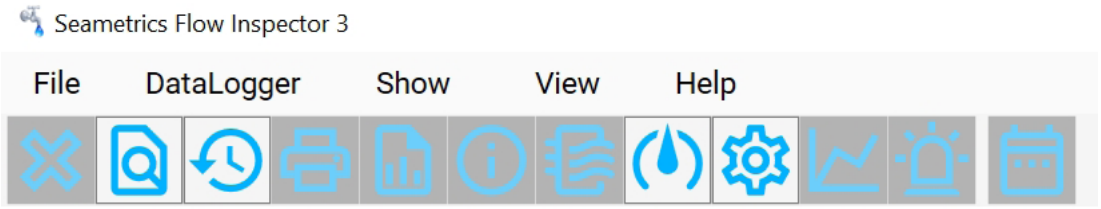

Show/Hide Event Markers *(RTC Meters Only)*


Print Report

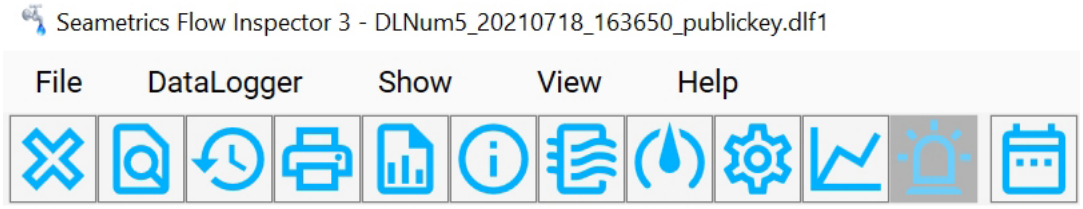

Units


Select Dates for Chart

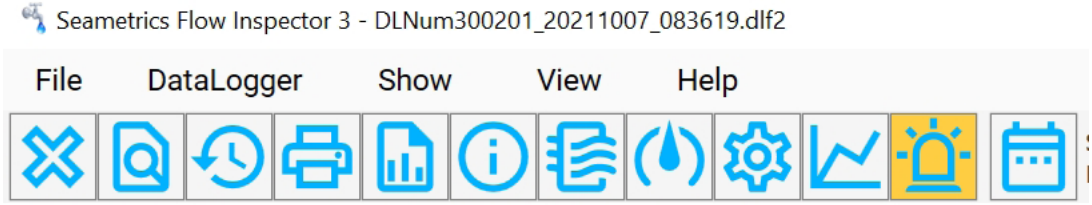
No File Open:



DLF1 File (Meter Without RTC) Open:



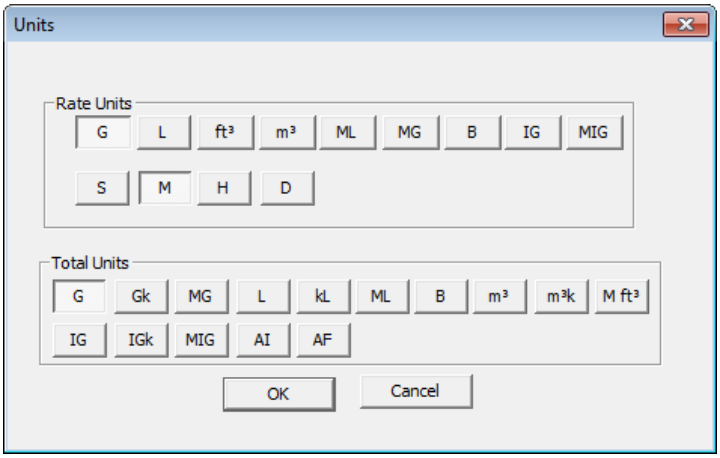
DLF2 File (Meter with RTC) Open:



With FlowInspector, you can customize your flow graph, including the flow rate units (displayed on the X axis), the flow total units, and the portion of the data collection period that you wish to view (displayed on the Y axis).

Selecting Flow Rate and Total Units

The Flow Rate is expressed as a volume of flow over a period of time. FlowInspector allows you to choose from a list of volume units, and a list of time units, to express your flow rate in the most useful format for your application. From the Main Screen, click on Show, then Units (or click the  button on the Tool Bar), to bring up this screen:



Units screen, showing Flow Rate setting of Gal/Min and Total Flow in Gallons.

On the Units screen, select Units, referring to the abbreviations below.

Rate Units			
Volume		**Time**	
G	Gallons	S	Seconds
L	Liters	M	Minutes
ft^3	Cubic Feet	H	Hours
m^3	Cubic Meters	D	Days
ML	Megaliter		
MG	Million Gallons		
B	Barrels (42 gal.)		
IG	Imperial Gallons		
MIG	Million Imperial Gallons		

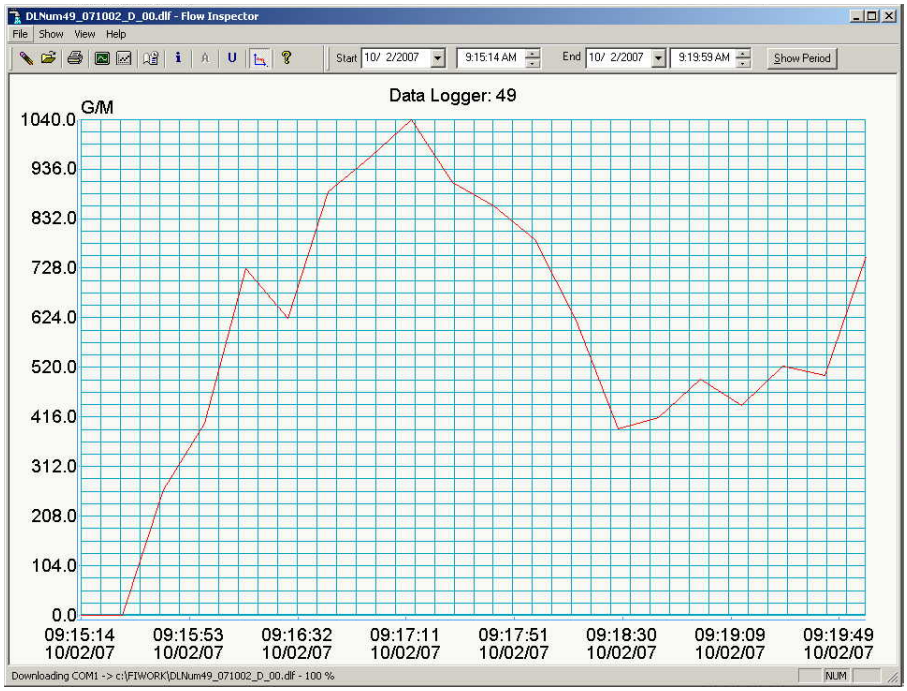
Total Units			
Volume		**Volume**	
G	Gallons	m^3k	Cubic Meters x 1000
Gk	Gallons x 1000	M ft^3	Million Cubic Feet
MG	Million Gallons	IG	Imperial Gallons
L	Liters	IGk	Liters
kL	Kiloliters	MIG	Million Imperial Gallons
ML	Megaliters	AI	Acre-Inches
B	Barrels (42 gal.)	AF	Acre-Feet
m^3	Cubic Meters		

When your Flow Rate and Flow Total units have been selected, **Click Save.** Your data will now display in the rate and total units you have selected. At any time, these choices can be changed and the data viewed with different units of your choice. If you wish to exit the screen without selecting or changing units, **Click Cancel**. No data will be lost.

Selecting a Time Period to View

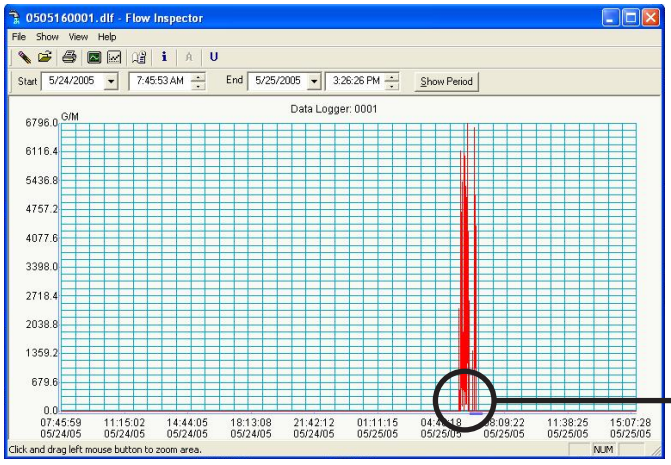
There are several ways to select and refine the desired portion of your collected data to view.

Viewing the Entire Time Period: When you download your data, a graph line will appear on the empty grid. Click on Show Original  to be sure that the entire file is displayed.

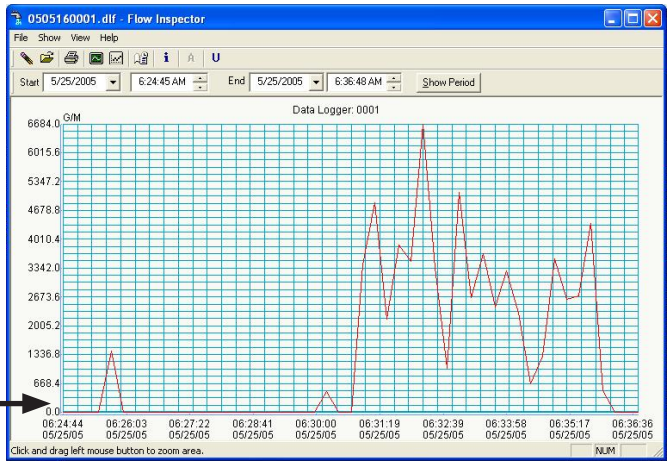


Depending on how much data was collected over what time period, the graph may have a spiky appearance and be difficult to read. If more detail is desired, it will be important to select a smaller portion of the data to view, by one of the methods described on the following page.

If your data is too condensed to read...



Zoom in on a time period for improved readability.



Shortening Time Period (Selecting by Zoom): The simplest and most intuitive way to select a smaller time period is by using the Zoom feature. Choose the approximate start date and time desired, position your cursor at that point on the baseline of the main grid, left-click the mouse and hold the button down as you drag to the right. As you drag the mouse, a yellow bar will expand until you reach the desired end point, then release. The time period defined by the blue line will expand to fill the entire grid. You can repeat this process several times, to narrow your view to as short a time period as you wish (down to a minimum of two data points). [NOTE: You may return to the full time period by clicking on Show Original at any time.]

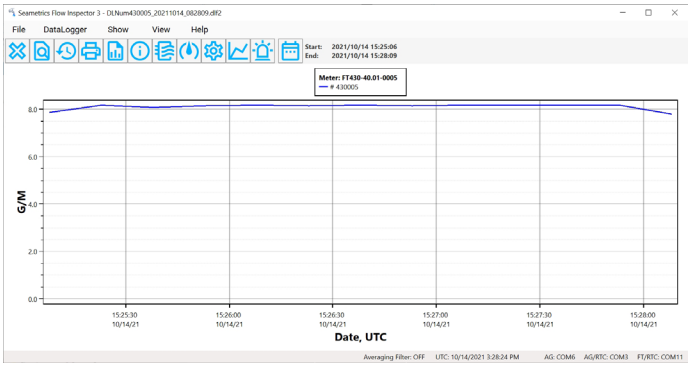
Shortening Time Period (Selecting by Date/Time Entry): This is the preferred method if the desired time period is known precisely. Locate the Calandar Icon at the top of the screen. Define the period you want to view in the Start and End Date/Time boxes, and click the Apply button on the Time Bar. FlowInspector will select data collection points nearest your chosen Start and End selections, and the selected time period will appear on the main grid. FlowInspector will prevent you from selecting a date/time outside of your data set. [NOTE: Use Show Original to return to the full time period.]

Averaging Data Points (Filtering)

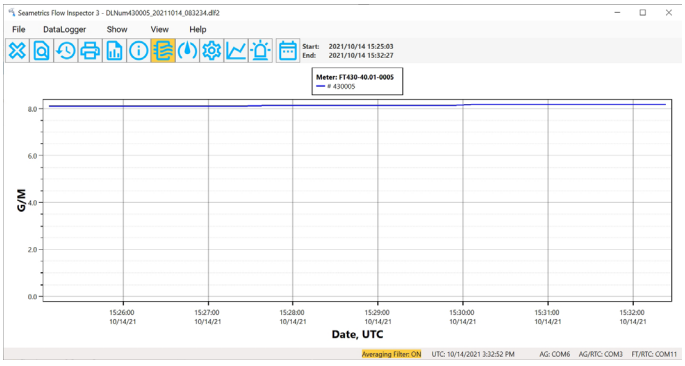
When it is more important to see trends than details, the Averaging Filter can be employed. With the filter turned on, a selected time period can be viewed with individual data points averaged to create a smoother curve. The user can choose the "smoothness" of the curve by selecting the number of data points that are averaged together.

To use the filter, select the Show menu, then Averaging Filter. Choose the number of data points you wish to average together, click Apply. (You may need to adjust this number a few times to achieve the best curve for your purposes.) The graph will adjust accordingly. Note that the Filter button on the main screen now appears activated; clicking on this button will turn the filter off and on, toggling between the raw data and the averaged data.

Averaging Filter "Off"



Averaging Filter "On"

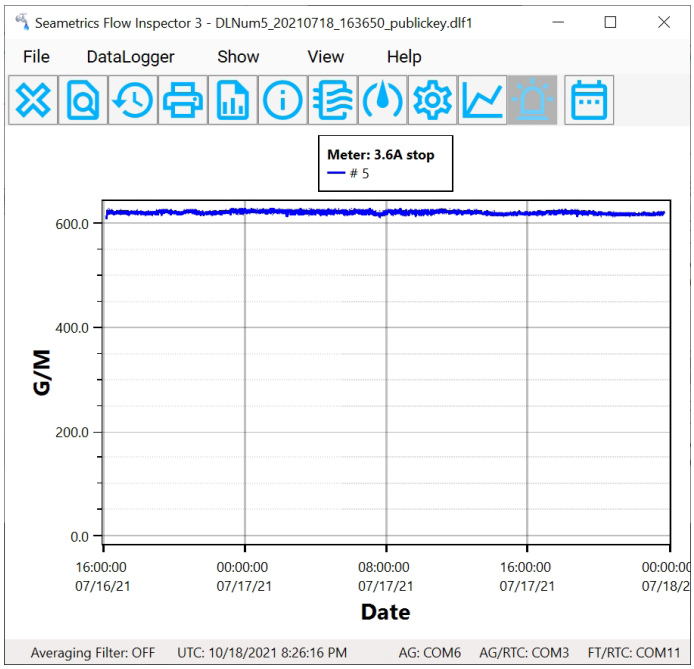


Averaging Data Points (Filtering)

Data and Event Markers:

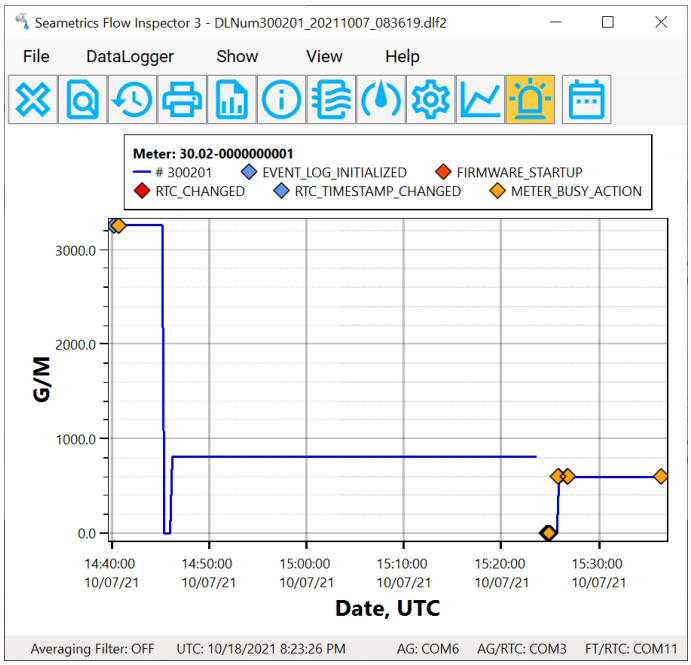
Meters without an RTC only show flow values on the graph; the 'Event Marker Toggle' button on the toolbar will be disabled.

DLF1 File for Meter without RTC, 'Event Marker Toggle' button disabled:

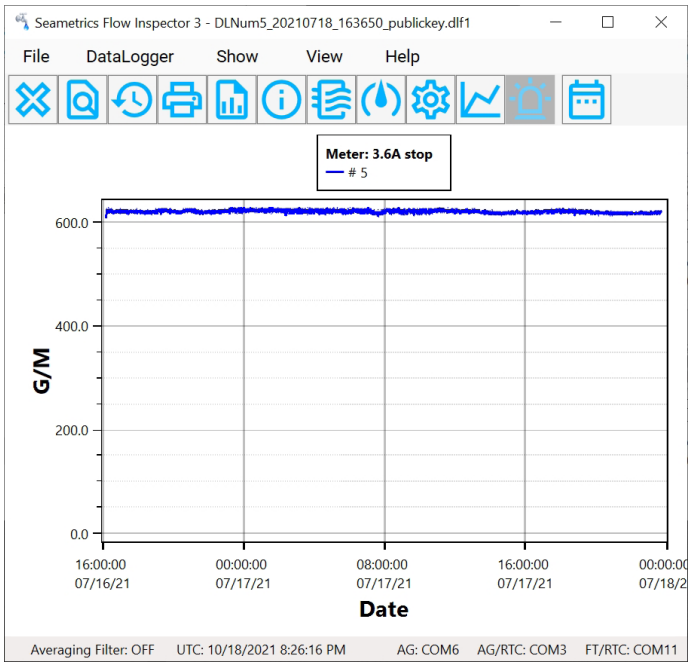


Meters with an RTC will have both flow values and events shown on the graph. The display of Event Markers can be toggled ON/OFF using the 'Event Marker Toggle' button on the toolbar.

Event Markers ON:

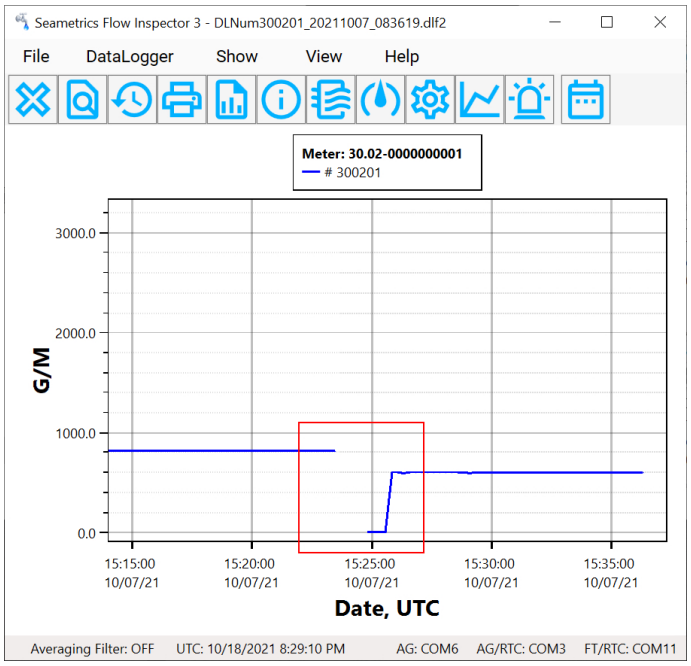


Event Markers OFF:

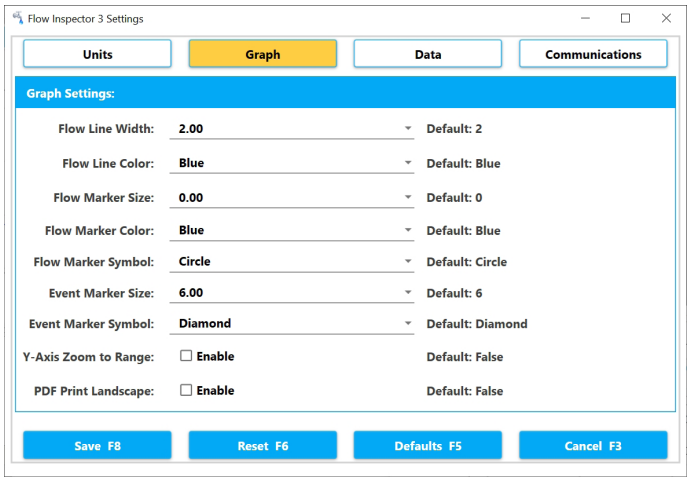


Flow Value Lines:
Lines will be drawn connecting each Flow Value. For Meters with an RTC if the Meter is Reset or Powered Off The lines connecting Flow Values will not be drawn indicating the meter was off.

Flow Values for Meter with RTC indicating a Period of Meter Power-Off :



Flow and Event Line and Marker Settings:
Settings exist for Flow Value Markers, Lines Connecting Flow Value Markers, and Event Markers



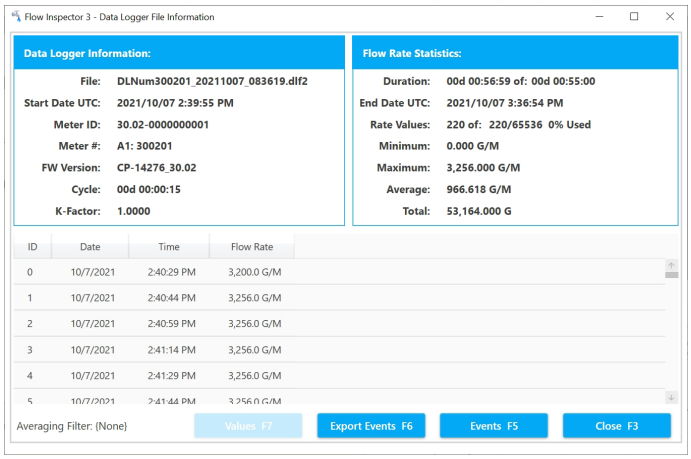
If a Marker Size is set to “0.00” the Markers will not be visible.
If the Flow Line Width is set to “0.00” the Lines connecting Flow Markers will not be visible.

Y-Axis Zoom to Range
If Enabled, the Y-Axis range will be set based on the minimum and Maximum Flow Value in the date range on the Graph.
If Disabled, the Y-Axis Minimum will always be set to 0.

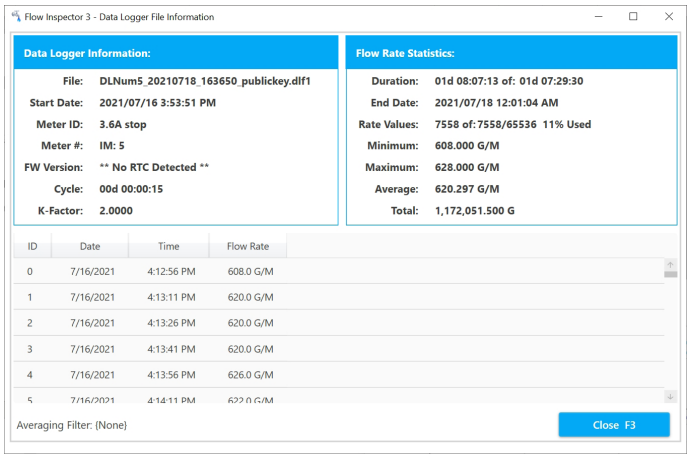
View and Print Data

Event Details Shown in File Information
Details for the Events as recorded by Meters with an RTC are shown on the File Information screen.

File Information for DLF files with Events:

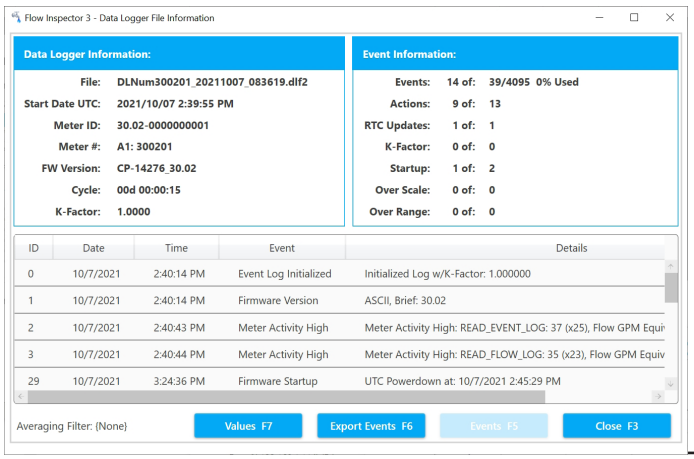


File Information for DLF files without Events:



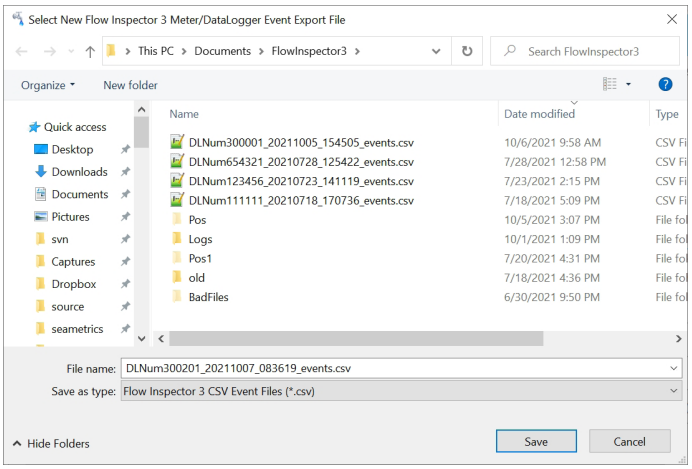
The "Events" and "Export Events" buttons are only shown when the DLF File is currently open and has Events (indicating it as an RTC).

View Events:



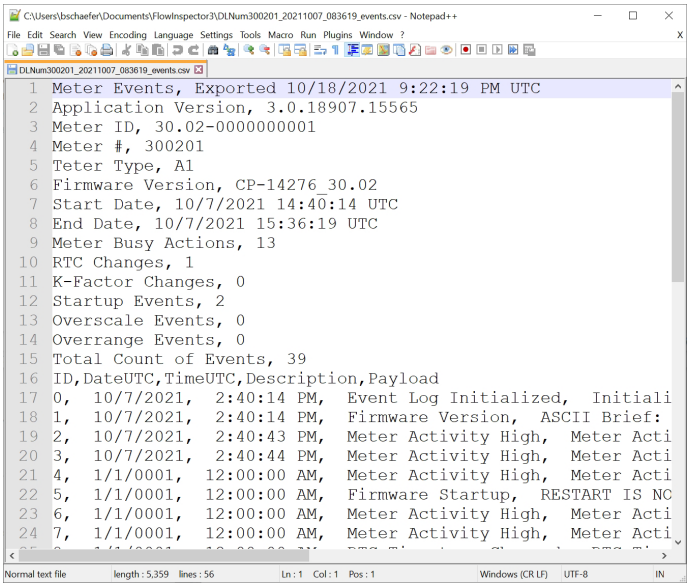
The Event Information in the header shows a summary of the Events.
The Event Details are listed in a table. All Events that have occurred in the meter since the last time Meter Settings were written to the meter are included in the Event Details.

Export Events:



When Exporting Events from File Information using the "Export Events" button, a dialog will be shown preloaded with the Event Export filename populated to match the original DLF file. The Extension of the Event Export file is a CSV, allowing it to be opened in any text editor or a spreadsheet program such as Excel.

Event Export CSV File



After the Event Export is complete, the generated CSV file will be opened in the program associated CSV files.

Viewing Day Report

The Day Report shows daily flow totals and maximum rates. Access the screen by clicking on Show/Day Report (or the button on the Tool Bar). Use the "From" and "To" boxes to change the time period you wish to view. The data can be printed or exported as a .csv or .txt file.

Printing Day Report

The Day Report can be printed in table form, showing daily total, daily maximum flow rate, and accumulated total flow to date. With the Day Report on the screen, click Print Report.

Printing Graphed Data

The graphed data from the main screen can be printed using the File/Print menu or the printer icon on the Tool Bar. This graphic representation also includes the time period; cycle time; total flow; and maximum, minimum and average flow rates.

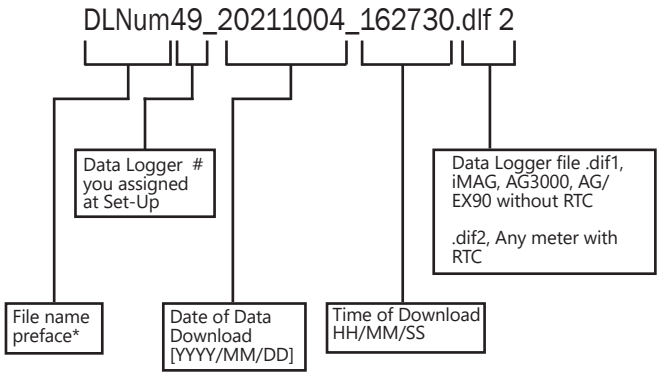
Selecting a File to View

Unless you have instructed it otherwise, FlowInspector 3.0 will automatically save your data in a folder named "FlowInspector3" in "Documents" on your computer. From the main screen, click on File, then Open. The FIWORK folder will open and you will see all your data files. Select the file you wish to work with, click Open. When it opens, click on the Show/Original menu to assure that you are viewing the complete file.

If you need to open a file that was not collected on your computer, save the file into FlowInspector3 and then open it using File/Open through the FlowInspector program.

Naming Convention

Understanding the file naming convention will allow you to easily select the file you wish to view. See diagram.



File Types

File Types/Extensions - DataLogger Files

DLF: Created by Flow Inspector 2.x.
DLF1: Created by Flow Inspector 3.x for meters without an RTC (no Events)
DLF2: Created by Flow Inspector 3.x for meters with an RTC (includes Events)

File Types/Extensions - Report Files

PDF: Report File created for viewing or printing.

File Types/Extensions – Data/Event Export Files

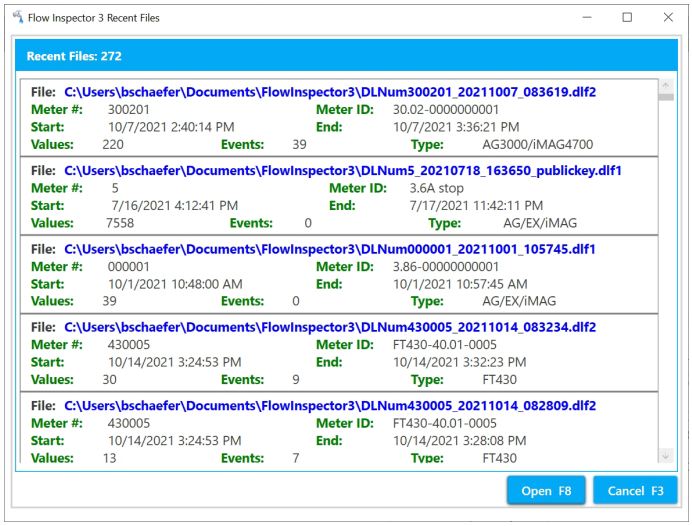
TXT: Export file of flow data
CSV: Export of flow or event data

File – Asymmetric Encryption Public Key Files

'rsaPublicKey.txt': Public key file used for asymmetric public key encryption

File Types/Extensions - Encrypted Files

DLFS1: DLF1 File Encrypted using Symmetric Key Encryption (Passphrase)
DLFA1: DLF1 File Encrypted using Asymmetric Key Encryption (Public/Private Key)
DLFS2: DLF2 File Encrypted using Symmetric Key Encryption (Passphrase)
DLFA2: DLF2 File Encrypted using Asymmetric Key Encryption (Public/Private Key)



File	Full path and file name
Meter #	The Meter # from the Meter Settings
Meter ID	The Meter ID from the Meter Settings
Start	Date/Time when datalogger settings were written to the Meter
End	Date/Time of last flow value (or last Event for Meters with RTC)
Values	Count of Flow Values written by Data Logger
Events	Count of Event Records written to Event Log (only for Meters with RTC)
Type	Type of Meter (Values are Firmware Version-Dependent)

Exporting the Data for Analysis

Sometimes it is desirable to create a spreadsheet using the raw flow readings; data exported to a spreadsheet can be manipulated to produce a wide variety of reports. With FlowInspector, you can export data in two formats: 1) .csv (automatically recognized by Excel) or 2) .txt (read by Notepad or convertible to Excel or other spreadsheet programs).

Exporting the Day Report (i.e., saving it with a different file extension)

1. Start with the main screen open to the graphed data that you want to capture and export.
2. Click Show/Day Report.
3. Click Export button. The FLOWINSPECTOR3 folder will open to the data file you are working with.
4. The "File Name" box will be auto-filled with a file named according to the convention described earlier, with the word "day" inserted into the name to indicate "day report".
5. In the "Save as Type" box at the bottom of the screen, use the arrow to select either .csv or .txt.
   [NOTE: Excel versions 2003 and earlier were limited to only 65536 data points. If exporting to one of these earlier versions, you will receive a pop-up message if your file contains more than 65536 records. Click OK if you wish to continue exporting the file in full, realizing that when the file is opened in Excel, only the first 65536 records will be there. Alternatively, click CANCEL, use the Averaging Filter to reduce the number of data points in your file, and try exporting the file again.]
6. Click Save. Your data file is now saved to your computer in the format you chose.

Exporting the Graphed Data (i.e., saving it with a different file extension)

1. Start with the main screen open to the graphed data that you want to capture and export.
2. Click on the File/Export menu.
3. The "File Name" box will be auto-filled with a file named according to the convention described earlier.
4. In the "Save as Type" box at the bottom of the screen, use the arrow to select either .csv or .txt.
5. Click Save. Your data file is now saved to your computer in the format you chose.

Opening Exported Files

Opening .csv Files

Open your copy of Excel. Using the Excel File/Open menu, locate your exported .csv file in the FLOWINSPECTOR3 folder in the Documents folder of your computer. Select the file you wish to analyze, click Open. The .csv file will open directly in Excel.

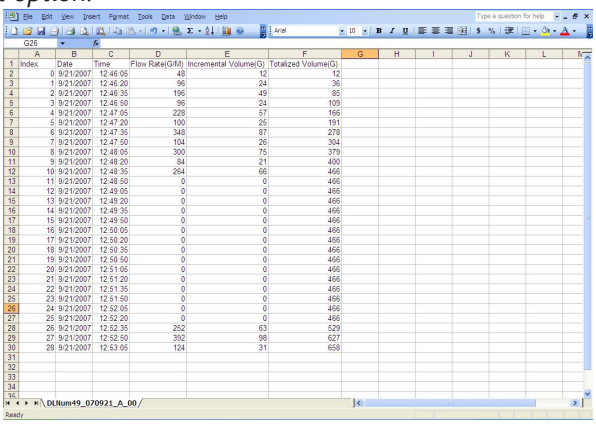
Opening .txt Files

To open the .txt file in Notepad, locate the file in the FLOWINSPECTOR3 folder in the Documents folder of your computer ; doubleclick on the file name.

To open the .txt file in Excel or another spreadsheet, first open your spreadsheet program. Using the spreadsheet's File/ Open menu, locate your exported .txt file in the FLOWINSPECTOR3 folder in the Documents folder of your computer. Select the file you wish to analyze, click Open. A Text Import Wizard box will open. You will need to navigate through a series of screens. The only change you need to make to the defaults on these screens is to select the "Comma" box at one point. *Only experienced spreadsheet users should use the .txt option.*

Analyzing the Data

The spreadsheet will format in columns (date, time, flow rate, incremental volume, totalized volume). All normal spreadsheet functions can be used on this data, for instance, custom averaging and oddtime totalization (average flow rate and multiple by time span). Refer to Excel instructions on performing various functions. A representative spreadsheet page appears at right.



Index	Date	Time	Flow Rate(G/M)	Incremental Volume(G)	Totalized Volume(G)
0	9/21/2007	12:46:05	48	12	12
1	9/21/2007	12:46:20	96	24	36
2	9/21/2007	12:46:35	196	49	85
3	9/21/2007	12:46:50	96	24	109
4	9/21/2007	12:47:05	228	57	166
5	9/21/2007	12:47:20	100	25	191
6	9/21/2007	12:47:35	348	87	278
7	9/21/2007	12:47:50	104	26	304
8	9/21/2007	12:48:05	300	75	379
9	9/21/2007	12:48:20	84	21	400
10	9/21/2007	12:48:35	264	66	466
11	9/21/2007	12:48:50	0	0	466
12	9/21/2007	12:49:05	0	0	466
13	9/21/2007	12:49:20	0	0	466
14	9/21/2007	12:49:35	0	0	466
15	9/21/2007	12:49:50	0	0	466
16	9/21/2007	12:50:05	0	0	466
17	9/21/2007	12:50:20	0	0	466
18	9/21/2007	12:50:35	0	0	466
19	9/21/2007	12:50:50	0	0	466
20	9/21/2007	12:51:05	0	0	466
21	9/21/2007	12:51:20	0	0	466
22	9/21/2007	12:51:35	0	0	466
23	9/21/2007	12:51:50	0	0	466
24	9/21/2007	12:52:05	0	0	466
25	9/21/2007	12:52:20	0	0	466
26	9/21/2007	12:52:35	252	63	529
27	9/21/2007	12:52:50	392	98	627
28	9/21/2007	12:53:05	124	31	658

Problems with Exported Data

How non-RTC data loggers work

When recording data, the data logger does not keep track of the actual time and date. When the data logger is initialized, the current time and date are recorded from the set-up computer and this time and date are assigned to the first data point recorded as seen in the "Log File Info" under the "Show" tab.

When data is downloaded from the data logger, the time and date are recorded from the download computer and all the data points collected are divided into the elapsed time from set up until download.

Although the data logger will only keep values for a maximum of 65,535 data points, it will keep track of the total, and how many data points have been collected since initialization.

However, since the data logger does not know the actual time and date, if all power is lost to the meter (external and battery) the data logger will stop recording. If power is reestablished, the data logger does not know how long the power was off for, so it cannot fill in the lost time frame, and therefore will not record any other data until it is re-initialized.

If the data logger is not reinitialized after power is lost, the same number of data points will continue to be divided into an ever-increasing time frame which will give the impression of an active data logger, but closer examination will show that data from the same previously recorded times will show different values during different downloads

Be aware that the symptom here is that data for the same time frame will be different when viewed during different downloads, or the data logger will show flow when the user knows there was no flow, or the Total from the printed download screen never changes

To see if this has happened:

Click on the "Show" tab and select "Log File Info", under "Data Logger", check the "Cycle:" time. This is the time in seconds selected in the "Setup" screen (this can be checked at any time you are connected to the meter.) This cycle time in seconds should match within 0.01 seconds. If it is wildly off, the data logger has stopped and will need to be reinitialized.

The skewed data up to the point of power loss can be recovered.

In the Log File Info screen, divide the cycle time into the number of samples to determine the actual elapsed time and add that to the start time. Then change the time on a computer to match this time and date and download the data again. The result should be very close to accurate. Remember to change the time on the computer back to actual, or auto set the time.

Also, be certain to reinitialize the data logger.

Persistent error messages:

When downloading data, if a dialog box tells you "problem reading meter", "No meter (or data logger) found", check the date on the set-up screen to be certain the data logger was initialized (does not say the date is 00/00/2000)

If the data logger has been initialized but gives the error messages "data can't download", "problem downloading from meter", or "timeout error", retry a few times but if the error persists, cycle power (external and battery) and you should be able to download the data.

Be sure to reinitialize the meter as soon as data is downloaded because data collection stops when power is lost.

If Flow inspector will not communicate with your meter after initialization, cycle all power (external and battery) and reinitialize, then verify communications.

Encrypt and Decrypt Files

Symmetric and Asymmetric Encryption

Symmetric Key Encryption

Flow Inspector will refer to the 'secret key' used for symmetric key encryption as a PassPhrase.
Symmetric-key algorithms are algorithms for cryptography that use the same cryptographic key for both the encryption of plaintext and the decryption of ciphertext. The key represents a shared secret between two or more parties that can be used to maintain a private information link. The requirement that both parties have access to the secret key is one of the main drawbacks of symmetric-key encryption, in comparison to public-key encryption (also known as asymmetric-key encryption).

Asymmetric Key Encryption

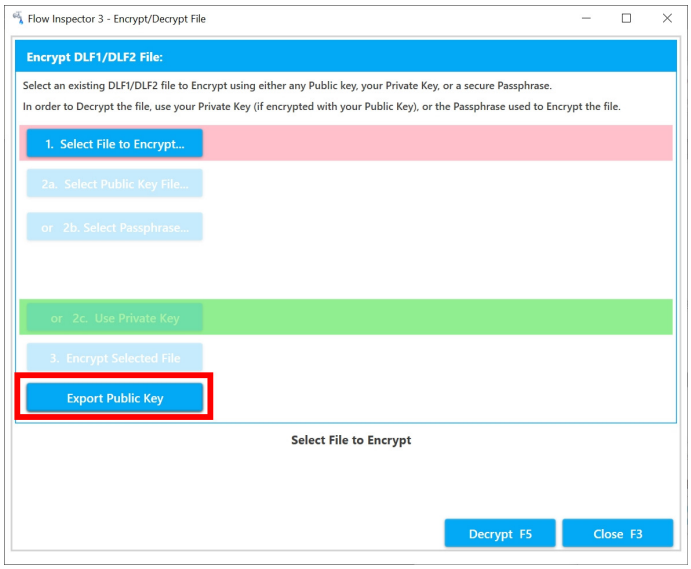
Public-key cryptography, or asymmetric cryptography, is a cryptographic system that uses pairs of keys. Each pair consists of a public key (which may be known to others) and a private key (which may not be known by anyone except the owner). The generation of such key pairs depends on cryptographic algorithms which are based on mathematical problems termed one-way functions. Effective security requires keeping the private key private; the public key can be openly distributed without compromising security.[1]

Exporting an Asymmetric Encryption Public Key

A public/private key pair is generated for each instance of Flow Inspector 3 using the Microsoft .NET System. Security.Cryptography namespace, and a new instance of an asymmetric algorithm class is created. After a new instance of the class is created, the key information is stored and is secured as part of the Windows Security on the computer running Flow Inspector 3.
In order for another user to Encrypt a file to be sent to you securely (encrypted), that other party must first have your Public Key. Therefore you must Export the Public Key and send the Public Key file to the other person.

Export Public Key

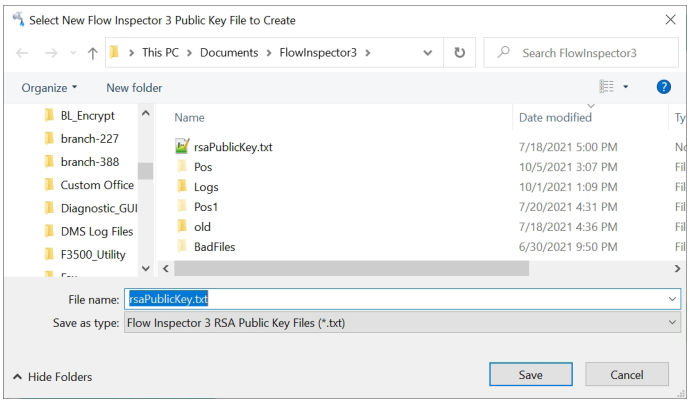
Selecting "Export Public Key" generates a file called 'rsa-PublicKey' in the Flow Inspector 3 data folder that you can send to another user to enable them to Encrypt files for secure transmission to you, which you can then decrypt using your public key later.



Export Public Key Dialog

The resulting Public Key File will be called:

'rsaPublicKey.txt'.

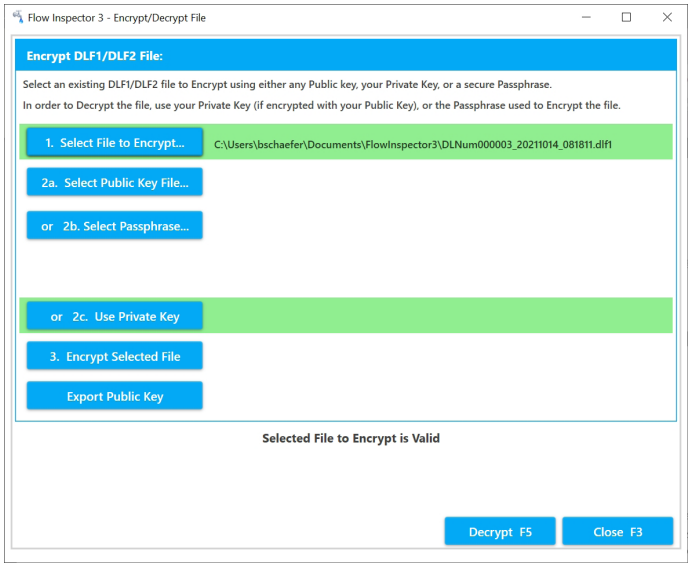


Encrypting a Data File

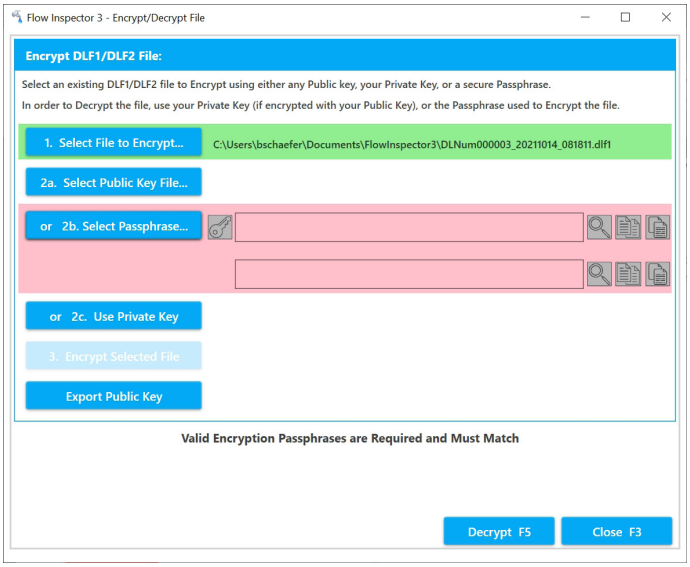
Encrypting a Data File using a PassPhrase
(Symmetric Encryption)

Steps:

1. Select A File to Encrypt (DLF1 or DLF2)



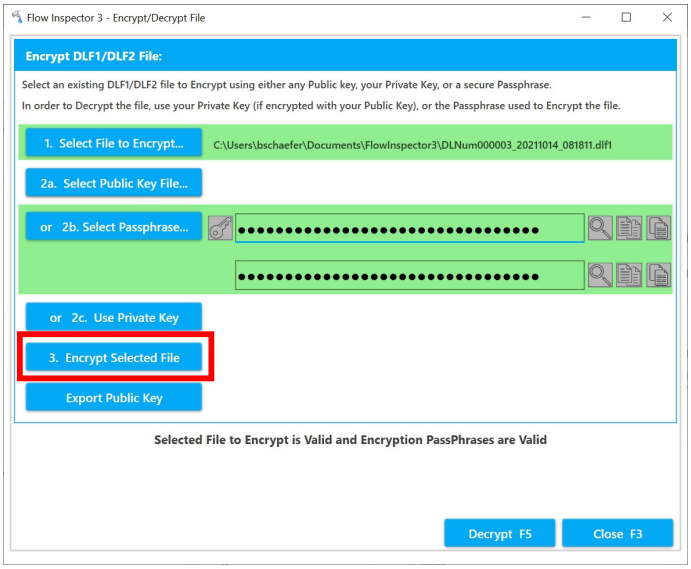
2. Enter/Generate PassPhrase



Select the KEY button  to Generate a Passphrase

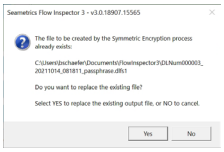
Select the PASTE button  to insert a previously used PassPhrase

3. Encrypt the File

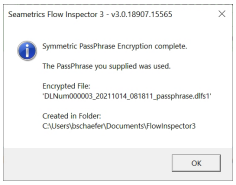


PassPhrase is valid, Ready to Encrypt

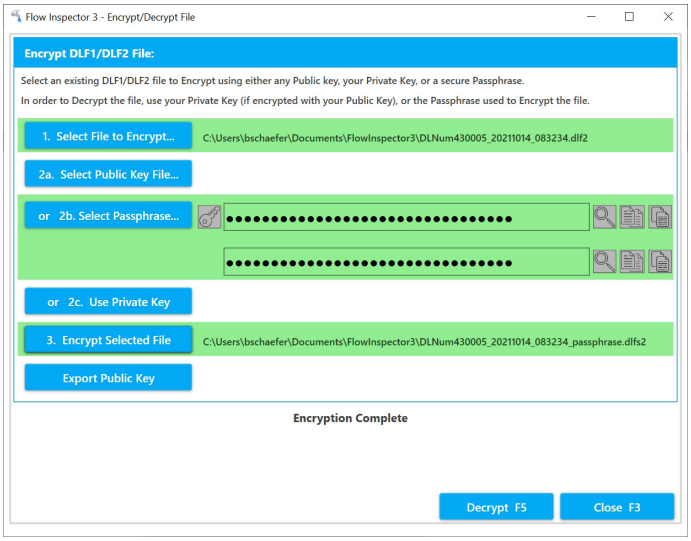
If the Encrypted File already Exists, a dialog will be shown to confirm that it should be replaced.



File Encrytion Complete



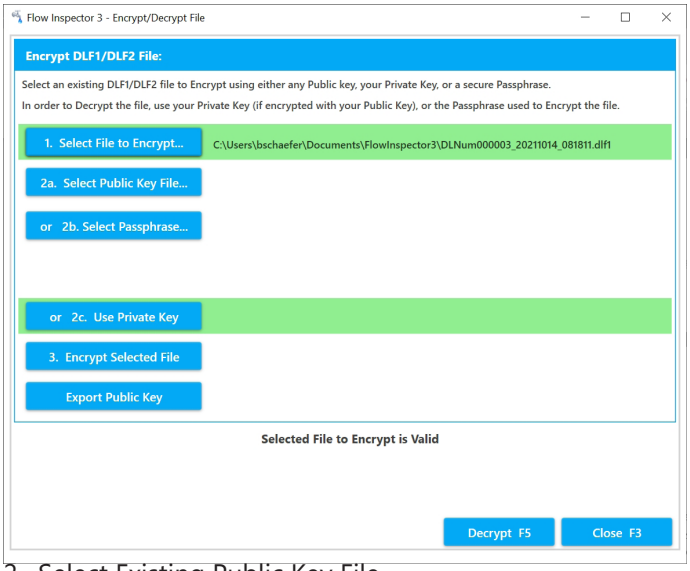
Result: DLFS1 or DLFS2 file consisting of symmetric-key encrypted cyphertext to send to another user



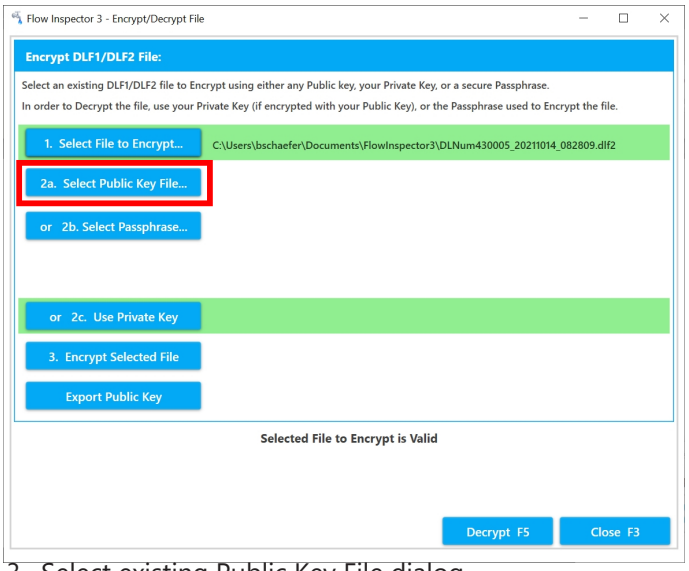
Encrypting a Data File using a Public Key from Another User
(Asymmetric Encryption)

Steps:

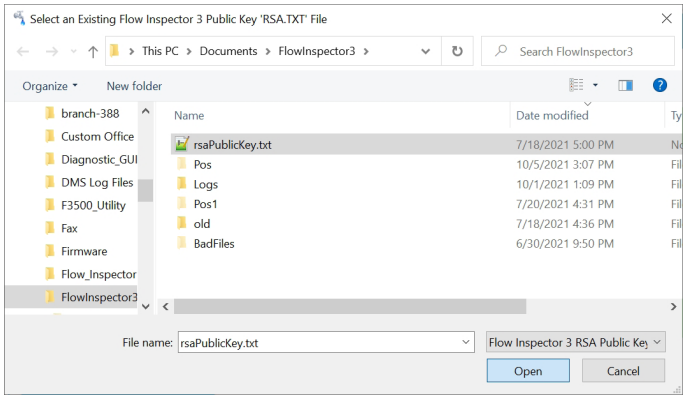
1. Select A File to Encrypt (DLF1 or DLF2)



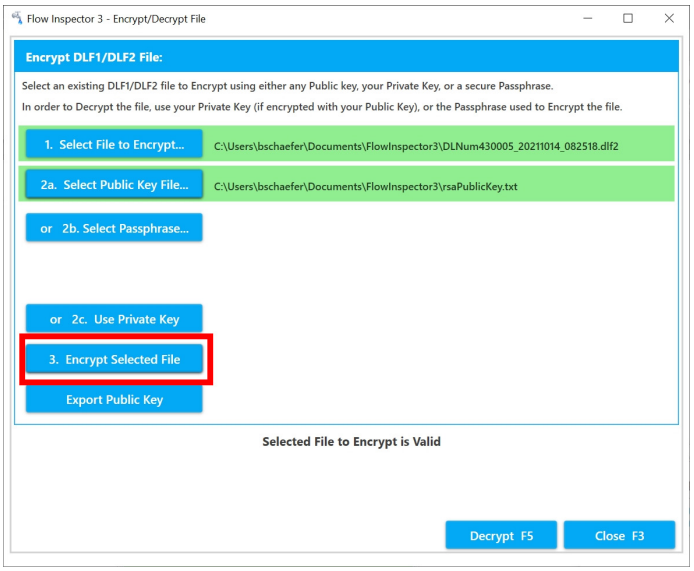
2. Select Existing Public Key File
   (from the party requesting the Encrypted File)



3. Select existing Public Key File dialog

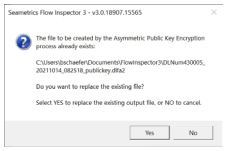


3. Encrypt the File

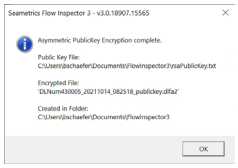


PassPhrase is valid, Ready to Encrypt

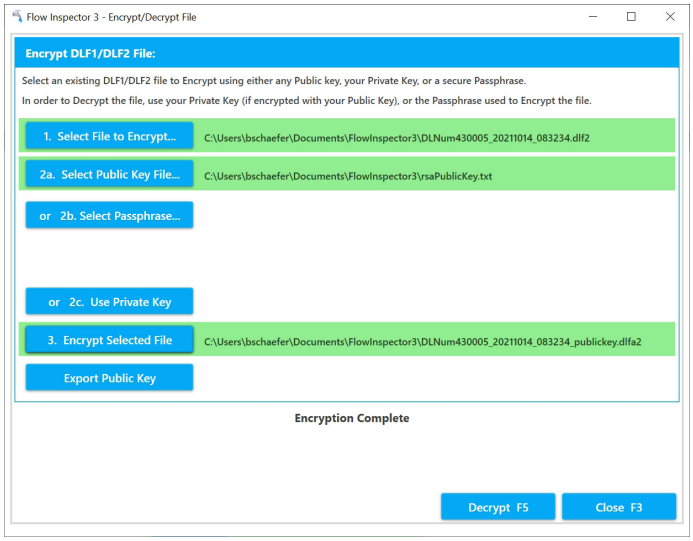
If the Encrypted File already Exists, a dialog will be shown to confirm that it should be replaced.



File Encrytion Complete



Result: DLFA1 or DLFA2 file consisting of asymmetric-key (or public/private-key) encrypted cyphertext to send to another user

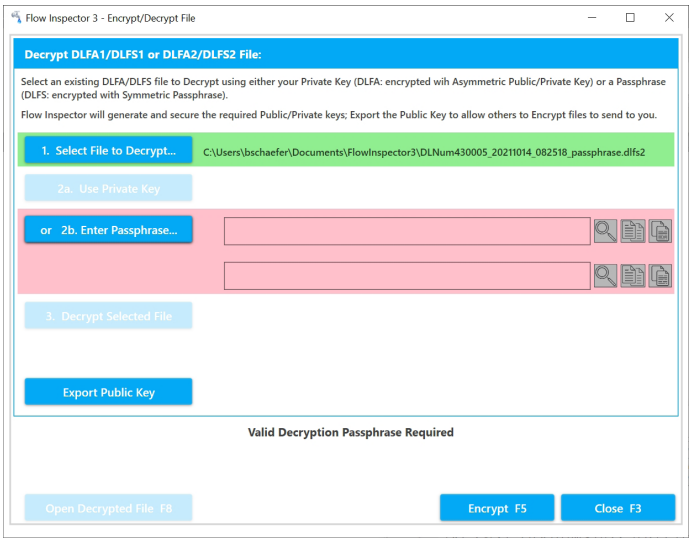


Decrypting an Encrypted File

Decrypting an Encrypted File using a PassPhrase
(Symmetric Decryption)

Steps:

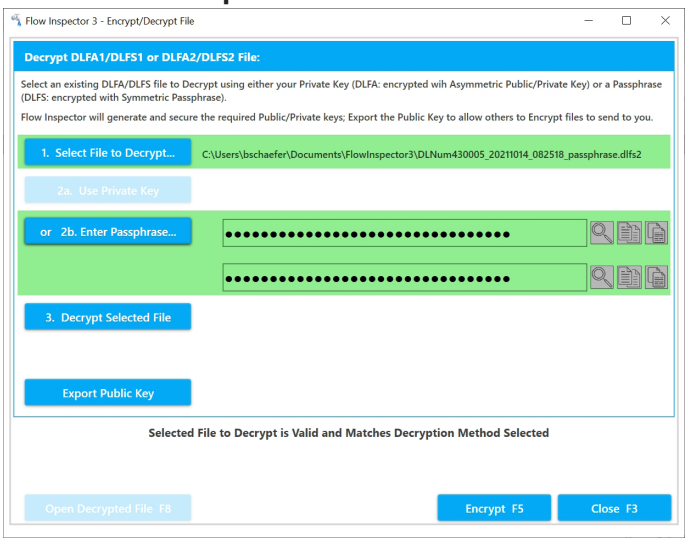
1. Select a File to Decrypt (DLFS1 or DLFS2)



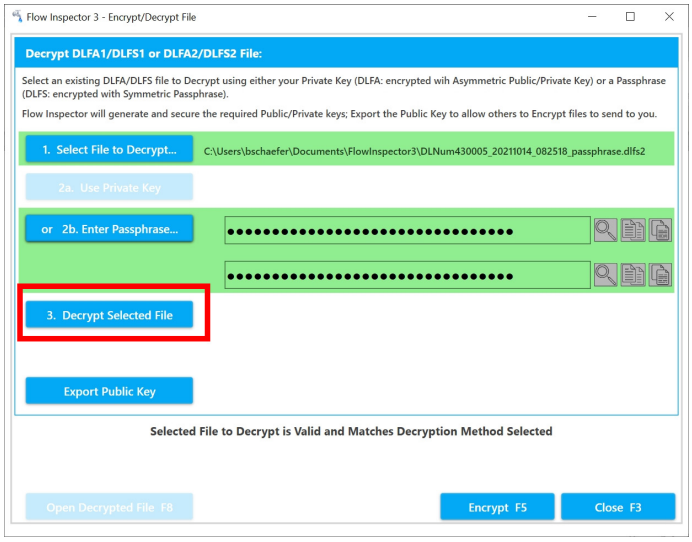
2. Paste a PassPhrase

Select the PASTE button  to insert a previously used PassPhrase.

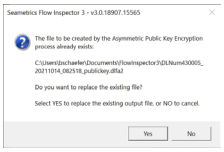
NOTE: It must be pasted into both fields.



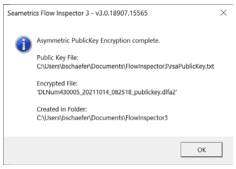
3. Decrypt the File



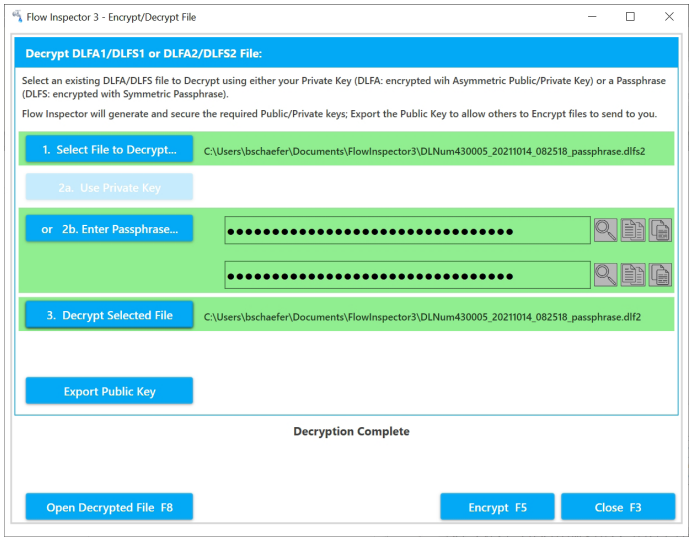
If the Decrypted File already Exists, a dialog will be shown to confirm that it should be replaced.



File Decryption Complete



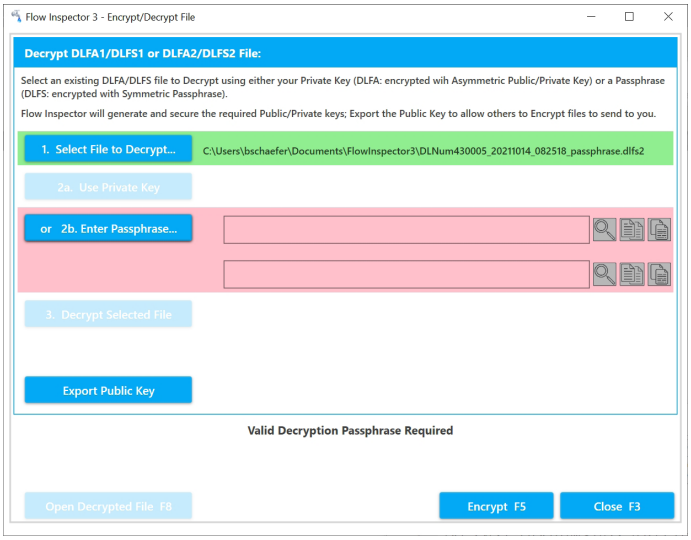
Result: DLF1 or DLF2 file from Symmetric-Key Encrypted File



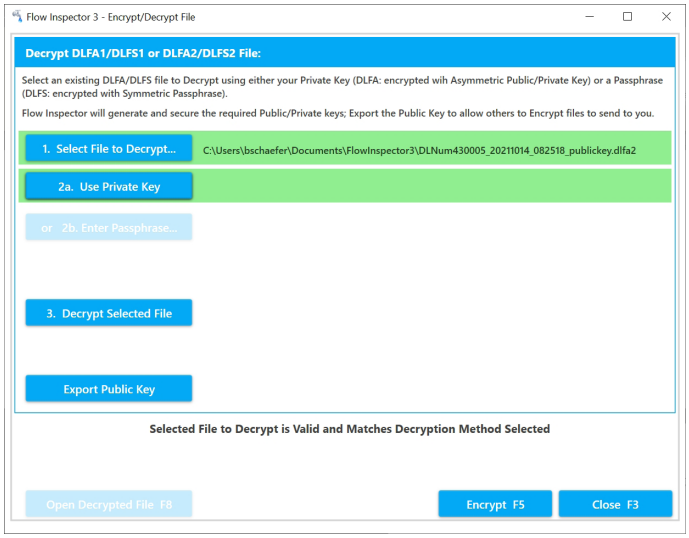
Decrypting an Encrypted File using your Private Key *(Asymmetric Decryption)*

Steps:

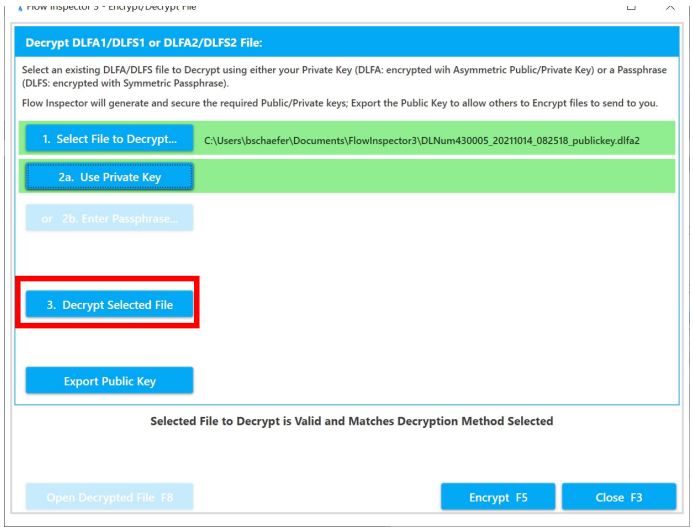
1. Select a File to Decrypt (DLFA1 or DLFA2)



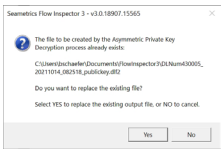
2. Select Private Key



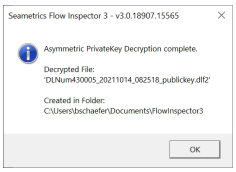
3. Decrypt the File



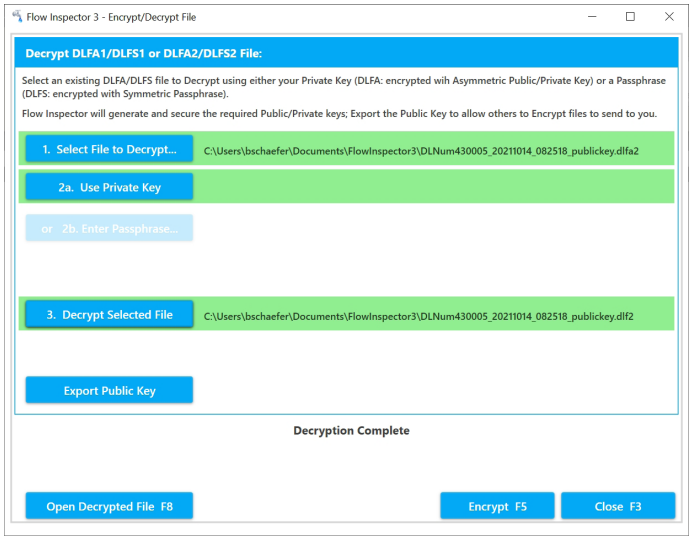
If the Decrypted File already Exists, a dialog will be shown to confirm that it should be replaced.



File Decryption Complete



Result: DLF1 or DLF2 file from Asymmetric-Key Encrypted File



The limited warranty set forth below is given by Seametrics, with respect to Seametrics brand products purchased in the United States of America.

Seametrics warrants that products manufactured by Seametrics, when delivered to you in new condition in their original containers and properly installed, shall be free from defects in material and workmanship. **Seametrics products are warranted against defects for a minimum period of two (2) years from date of installation, unless otherwise specified, with proof of install date. If no proof of install date can be provided, warranty period will be two (2) years from date of shipment from Seametrics, as defined on Seametrics' invoice.** Seametrics' obligation under this warranty shall be limited to replacing or repairing the part or parts, or, at Seametrics' option, the products, which prove defective in material or workmanship. The following are the terms of Seametrics' limited warranty:

a. Buyer must give Seametrics prompt notice of any defect or failure and satisfactory proof thereof.
b. Any defective part or parts must be returned to Seametrics' factory or to an authorized service center for inspection.
c. Buyer will prepay all freight charges to return any products to Seametrics' factory, or another repair facility. as designated by Seametrics.
d. Defective products, or parts thereof, which are returned to Seametrics and proved to be defective upon inspection, will be repaired to factory specifications.
e. Seametrics will deliver repaired products or replacements for defective products to the buyer (ground freight prepaid) to the destination provided in the original order.
f. Products returned to Seametrics for which Seametrics provides replacement under this warranty shall become the property of Seametrics.
g. This limited warranty covers all defects encountered in normal use of Seametrics products, and does not apply to the following cases:
    i. Loss of or damage to Seametrics product due to abuse, mishandling, or improper packaging by buyer
    ii. Failure to follow operating, maintenance, or environmental instructions prescribed in Seametrics' instruction manual
    iii. Products not used for their intended purpose
    iv. Alterations to the product, purposeful or accidental
    v. Electrical current fluctuations
    vi. Corrosion due to aggressive materials not approved for your specific product
    vii. Mishandling, or misapplication of Seametrics products
    viii. Products or parts that are typically consumed during normal operation
    ix. Use of parts or supplies (other than those sold by Seametrics) which cause damage to the products, or cause abnormally frequent service calls or service problems
h. A new warranty period will be established for repaired products, or products replaced during the original warranty period.
i. In the event that equipment is altered or repaired by the buyer without prior written approval by Seametrics, all warranties are void. Damage caused by equipment or accessories not manufactured by Seametrics may void the product's warranty.
j. SOFTWARE: The Seller grants the user a non-exclusive license to use Seametrics' software, according to the following limitations and conditions:
    i. The user may install the software on one or more desktop or laptop computers.
    ii. All title and intellectual rights to the software are owned by Seametrics.
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