

# GCFlash™ 1.0

## Online Phase Equilibrium for GC

For Windows 2000/NT/XP

GCFlash is an online OPC client/server application that obtains compositional data from online Gas Chromatographs (GC) to provide instant phase equilibrium and gas property analysis. GCFlash can calculate instantaneous dew points, heating values, or a number of other properties from the composition of your process stream; Moreover, this data can be used to optimize your process. GCFlash can be quickly and easily configured to retrieve the required data from your control system using OPC II. Then it can store the equilibrium flash results and properties in a database or specified tags of other OPC servers. As an OPC server, GCFlash holds the tags for all the latest updated results. Control set points are available for optimal processing according to the flash results (example: optimizing the adsorbent rate required for a process).

### Model and Equation of State

GCFlash is developed on the basis of the NIST Standard Reference Database 4 and is compatible with 215 components. GCFlash can be used for pure fluids or for mixtures of up to 20 components.

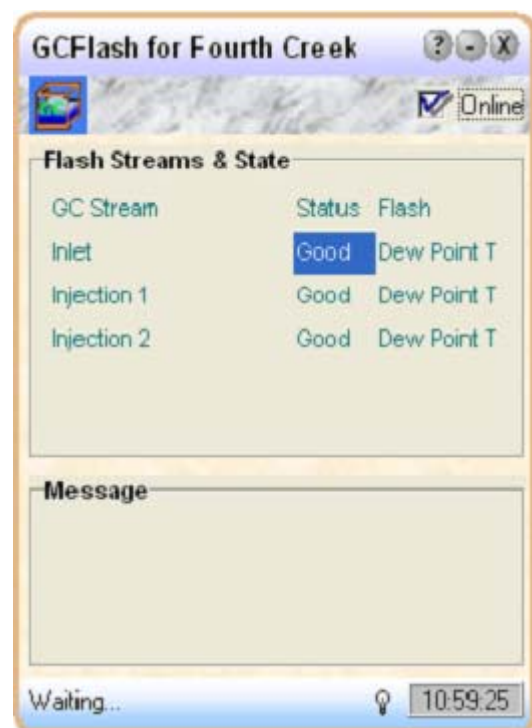
GCFlash calculates phase equilibrium with Peng Robinson equation of state (EOS) and offers a choice of Peng Robinson (PRS) or the NIST extended corresponding states model (EXCST) for the calculation of the 17 thermodynamic and transport properties.

### Flash Routines

Temperature - Pressure Flash
Bubble Point Pressure (fixed T)
Bubble Point Temperature (fixed P)
Dew Point Pressure (fixed T)
Dew Point Temperature (fixed P)
Pressure - Vapor Fraction Flash
Temperature - Vapor Fraction Flash

### Functions and Features

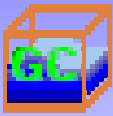
- Easy and fast implementation by configuration for unlimited GCs, GC components and GC flashes
- Seamless interface and I/O with OPC 1.0, OPC 2.0 and OPC 3.0
- Fast processing and instant results for 7 flash routines and 17 thermodynamic and transport properties of each phase
- Direct open links and flash result feeding to other applications



FlowPhase Inc.

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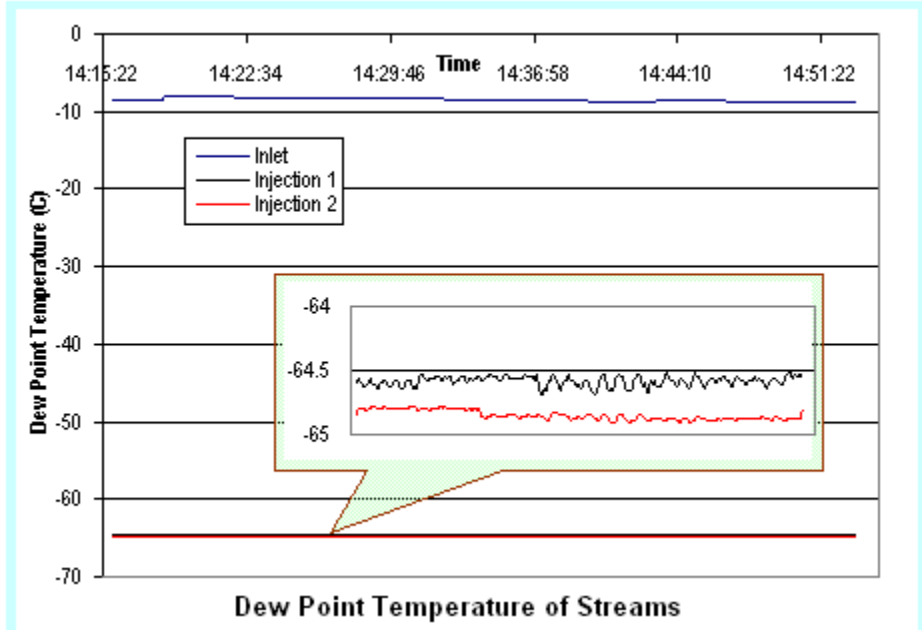
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### Structures

GCFlash keeps monitoring the GCs and runs the required flash calculations at a predefined interval. For each scan, it will perform the following operations:

- Retrieve the flowing conditions and composition from the GCs through the built in OPC interface
- Perform the specific flash calculation for each GC
- Publish the specified flash results to the OPC servers specified in the configuration or direct the specified flash results to a file or database
- Publish the flash results of all GC flashes on their own for the access of other OPC client applications.



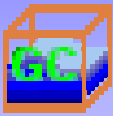
Property	Default Unit
Phase fraction	
Phase molecular weight	g/mol
Compressibility factor	
Density	kg/m <sup>3</sup>
Mole density	mol/liter
Enthalpy	cal/mol
Entropy	cal/(mol.k)
Specific heat at constant pressure	cal/(mol.k)
Ratio of specific heat	
Sound speed	m/sec
JT Coefficient	k/bar
Viscosity	micropoise
Thermal conductivity	w/(m.k)
Volume	liter/mol
Specific heat at constant volume	cal/(mol.k)
Critical Pressure	Bar
Critical Temperature	K
<b>Note:</b> The properties can be release in the customized unit by configuration	

### Implementation

GCFlash can be easily implemented into facilities utilizing computer systems compatible with OPCII, which is currently the oilfield standard. A normal installation, configuration, and fine tuning time for an existing facility measurement system is approximately 1 week.

Please contact FlowPhase Inc. for more information or a quote for GCFlash implementation.



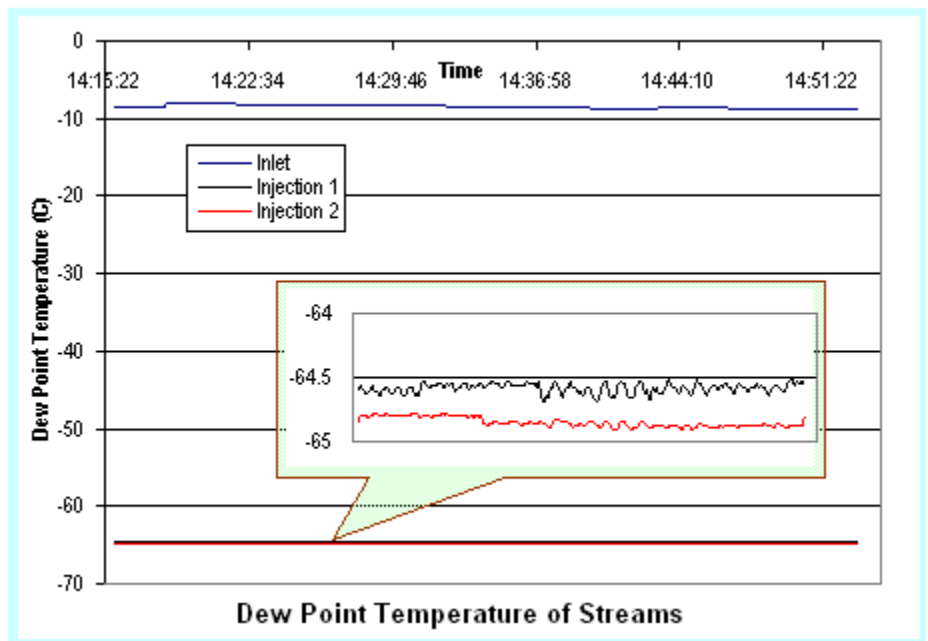
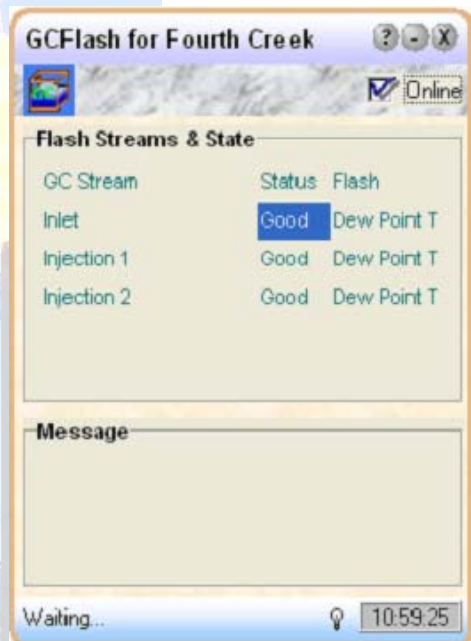


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