

# Datasheet:

## Software Applications

### Dynamic Uncertainty

#### Introduction

When measuring oil and gas, there are many designs and configurations that can be used. The uncertainty in measurement will depend on the selection of the meter, the standards that are used for the calculations, the manufacturer, model and range for each item of primary and secondary instrumentation and factors such as whether density is measured using a densitometer or calculated from the composition.

Demonstrating uncertainty is a requirement. Not maintaining an uncertainty budget can result in exposure to bias error and without knowledge of uncertainty in measurement a meaningful comparison cannot be achieved.

KELTON has over 20 years' experience in evaluating uncertainty in measurement systems and implementing a Dynamic Uncertainty application will ensure the uncertainty calculated is progressively updated to match your process conditions and composition.

Dynamic Uncertainty is delivered as a KELTON MeterManager application, which allows process data to be read via OPC, results to be stored securely in a database and visibility across an organisation. Uncertainty calculations can either be run at a user defined frequency or triggered based on an event or parameter value changing.

#### Key Features

- Fully traceable uncertainty calculations
- Uncertainty recalculated as process conditions change
- Uncertainty written back to Flow or Supervisory computer system
- Uncertainty visible across entire organisation
- Full report available for every saved result
- Uncertainty based alarms
- User configurable

#### Benefits

- Compliance is demonstrated
- Meaningful comparisons between measurements can be made
- Calibration intervals can be optimised and uncertainty based
- Designed and developed by KELTON measurement consultants
- Supported by KELTON IT professionals

#### About KELTON™

Fully accredited, KELTON is the leading independent measurement consultancy and software developer for the oil and gas industry. For well over two decades, KELTON has helped many international and national operators to ensure their full compliance with industry regulations. Whether clients require inspection, auditing or certification as part of System Compliance, uncertainty calculations for System Assurance or System Support – in KELTON they find a partner they can trust.

Services include:

- System Compliance
  - Inspection
  - Audit
  - Certification
- System Assurance
  - Design uncertainty
  - Modelling
  - System uncertainty
- System Support
  - Support partnerships
  - Training
  - Manuals/Procedures
- Measurement Software
  - Desktop applications
  - Database applications
  - Pipeline applications

KELTON encompasses BS EN ISO 9001, ISO 14001 & ISO 45001 and UKAS type 'C' Accreditation, is Microsoft Certified and is recognised as an Investor in People. Support is available from strategic locations across the world. Find your nearest KELTON location [here](#).

If additional information is required visit:

[www.kelton.co.uk](http://www.kelton.co.uk)



# Datasheet: Software Applications Dynamic Uncertainty



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Home Calculation

Save Save & Close Read OPC Tags Calculate Write OPC Tags

Sites

- Alpha
  - Gas Export
    - Stream 1
    - Stream 2
      - FQI-1002 (Flow Computer)
      - UN-301 - Gas Orifice
        - Stream 3
        - Stream 4
      - Oil Export

Uncertainty Module: UN-301 - Gas Orifice, Version 14

Input / Output Composition Pressure Differential Pressure Temperature Density Standard Density Calorific Value Flow Rate

Options

DP Transmitters 1

Inputs

| Parameter             | Value    | Unit | Data Source           |
|-----------------------|----------|------|-----------------------|
| Pressure              | 57.62047 | bar  | FQI.S1_PV.UPSTR_PRESS |
| Differential pressure | 110.029  | mbar | FQI.S1_DP.DP_STACK    |
| Temperature           | 66.87311 | °C   | FQI.S1_PV.UPSTR_TEMP  |

Outputs

| Name                 | Value   | Absolute Uncertainty (k=2)  | Relative Uncertainty (k=2)  | Destination | Trend |
|----------------------|---------|-----------------------------|-----------------------------|-------------|-------|
| Mass flow            | 56.6394 | tonne/hr 0.538704           | tonne/hr 0.951112           | OPC Set     | ✓     |
| Standard volume flow | 72757.7 | Sm <sup>3</sup> /hr 756.993 | Sm <sup>3</sup> /hr 1.04043 | OPC Set     |       |
| Energy flow          | 2941.87 | GJ/hr 33.3233               | GJ/hr 1.13272               | OPC Set     |       |

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Home Calculation

New Calculation Configure Rule Open Delete History Help

Sites

- Alpha
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      - FQI-1002 (Flow Computer)
      - UN-301 - Gas Orifice
        - Stream 3
        - Stream 4
      - Oil Export

Calculation History

Site Hierarchy UN-301 - Gas Orifice Reset Date Range 18/09/2016 to 18/09/2016 Reload Export to Excel Export

Drag a column header and drop it here to group by that column

| Site  | System     | Section  | Tag      | Calculation          | Versi | Run Date            | Value            | Absolute Uncertainty | Relative Uncertainty |
|-------|------------|----------|----------|----------------------|-------|---------------------|------------------|----------------------|----------------------|
| Alpha | Gas Export | Stream 2 | FQI-1002 | UN-301 - Gas Orifice | V14   | 18/09/2016 14:06:00 | 14.8588 tonne/hr | 1.45045 tonne/hr     | 9.7616 %             |
| Alpha | Gas Export | Stream 2 | FQI-1002 | UN-301 - Gas Orifice | V14   | 18/09/2016 14:05:00 | 14.8592 tonne/hr | 1.45049 tonne/hr     | 9.76161 %            |
| Alpha | Gas Export | Stream 2 | FQI-1002 | UN-301 - Gas Orifice | V14   | 18/09/2016 14:04:00 | 25.81 tonne/hr   | 0.849721 tonne/hr    | 3.29222 %            |
| Alpha | Gas Export | Stream 2 | FQI-1002 | UN-301 - Gas Orifice | V14   | 18/09/2016 14:03:00 | 35.5276 tonne/hr | 0.649737 tonne/hr    | 1.82882 %            |
| Alpha | Gas Export | Stream 2 | FQI-1002 | UN-301 - Gas Orifice | V14   | 18/09/2016 14:01:59 | 46.9244 tonne/hr | 0.556379 tonne/hr    | 1.18569 %            |
| Alpha | Gas Export | Stream 2 | FQI-1002 | UN-301 - Gas Orifice | V14   | 18/09/2016 14:00:59 | 50.3889 tonne/hr | 0.545232 tonne/hr    | 1.08205 %            |
| Alpha | Gas Export | Stream 2 | FQI-1002 | UN-301 - Gas Orifice | V14   | 18/09/2016 13:59:58 | 54.6903 tonne/hr | 0.539101 tonne/hr    | 0.985735 %           |
| Alpha | Gas Export | Stream 2 | FQI-1002 | UN-301 - Gas Orifice | V14   | 18/09/2016 13:58:58 | 54.6903 tonne/hr | 0.539107 tonne/hr    | 0.985745 %           |
| Alpha | Gas Export | Stream 2 | FQI-1002 | UN-301 - Gas Orifice | V14   | 18/09/2016 13:57:58 | 68.4222 tonne/hr | 0.559232 tonne/hr    | 0.817325 %           |
| Alpha | Gas Export | Stream 2 | FQI-1002 | UN-301 - Gas Orifice | V14   | 18/09/2016 13:56:57 | 71.9573 tonne/hr | 0.571069 tonne/hr    | 0.793621 %           |
| Alpha | Gas Export | Stream 2 | FQI-1002 | UN-301 - Gas Orifice | V14   | 18/09/2016 13:55:57 | 71.9556 tonne/hr | 0.571054 tonne/hr    | 0.79362 %            |
| Alpha | Gas Export | Stream 2 | FQI-1002 | UN-301 - Gas Orifice | V14   | 18/09/2016 13:54:57 | 71.9569 tonne/hr | 0.571066 tonne/hr    | 0.793622 %           |
| Alpha | Gas Export | Stream 2 | FQI-1002 | UN-301 - Gas Orifice | V14   | 18/09/2016 13:53:57 | 71.9576 tonne/hr | 0.571069 tonne/hr    | 0.793619 %           |
| Alpha | Gas Export | Stream 2 | FQI-1002 | UN-301 - Gas Orifice | V14   | 18/09/2016 13:52:57 | 77.8938 tonne/hr | 0.594945 tonne/hr    | 0.76379 %            |
| Alpha | Gas Export | Stream 2 | FQI-1002 | UN-301 - Gas Orifice | V14   | 18/09/2016 13:51:56 | 81.4345 tonne/hr | 0.611085 tonne/hr    | 0.7504 %             |
| Alpha | Gas Export | Stream 2 | FQI-1002 | UN-301 - Gas Orifice | V14   | 18/09/2016 13:50:56 | 86.1858 tonne/hr | 0.634493 tonne/hr    | 0.736193 %           |