

# ABLE FLAREMASTER™



## FLARE METERING ENHANCEMENT SYSTEM

- ▶ Reliable and repeatable flare gas flow measurement during process upsets
- ▶ Effective operation during gas stratification and gas density variation
- ▶ Accurate flow velocity measurement up to 1000m/sec
- ▶ Significant reduction in flare gas measurement uncertainty
- ▶ Potential decrease in reported flare gas totals and consequent financial penalties
- ▶ Installation on 'live' process without shutdown

# FLAREMASTER™

## FLARE METERING WITH

The ABLE FlareMaster, in its fully realised form, is a dual redundancy, supervisory system designed to optimise the performance of the current generation of ultrasonic flare gas meters (FGM) by significantly reducing measurement uncertainty and ensuring sustainability of measurement during the most challenging process upsets and anomalies. This is achieved by applying a high level of processing capacity and an enhanced layer of analytics to the data being generated by the base FGM. FlareMaster is able to data mine and harvest the myriad signals routinely produced by an FGM that aren't normally visible or accessible to a standard, associated flow computer. FlareMaster utilises self-calibration and decision making techniques (AI) to repair and reconstruct flow measurements whenever the base FGM fails.

The screenshot displays the 'FlareMaster™ Module 1' software interface. The main title 'FLAREMASTER' is prominently displayed in the center. The interface is divided into several functional sections:

- ModBus Configuration:** Includes fields for 'Port' (set to COM1) and 'ModBus ID' (set to 1), with a 'Connect' button.
- Installation Details:** Lists system information such as 'ABL-FSTK/001', 'Able Instruments', 'READING - STACK 1', and '22" HP Flare test'.
- Compressibility & Viscosity:** Contains input fields for 'Standard Compressibility' (0.996914459947576), 'Operating Temperature' (288.1500 K), 'Operating Pressure' (101.3250 kPa), and 'Operating Compressibility' (0.996914459947576). It also features a 'Calculate' button and a 'Kinematic Viscosity' field (0.0000015).
- Gas Density Model Options:** Includes a dropdown menu currently set to 'Enhanced Density Model on for flaring'.
- Update Registers:** Features 'Read' and 'Write' buttons.
- Gas Composition:** A table listing various gases and their percentages.

The status bar at the bottom left indicates 'V2.01 | Instrument connected'.

Gas	Percentage (%)
C1 Methane	62.6463
C2 Ethane	1.0000
C3 Propane	0.0000
C4 i-Butane	1.0000
n-Butane	1.7569
C5 i-Pentane	0.9961
n-Pentane	1.0039
n-Hexane	1.4941
n-Heptane	0.7500
C6+ n-Octane	0.3765
n-Nonane	0.1890
n-Decane	0.5550
N2 Nitrogen	15.0000
CO2 CO2	1.0500
He Helium	2.1867
H2 Hydrogen	1.0625
H2S H2S	1.5430
Ar Argon	2.8790
H2 Water	1.3330
CO CO	1.6780
O2 Oxygen	1.5000
	100.000

# REDUCED UNCERTAINTY

Flaremaster is a modular system comprising the following elements: **FlareMaster Enhanced Density Module (EDM)** is able to provide the FGM with full flare gas density inputs in order to negate the effects of density distorting gas compositions. Typically, this will improve accuracy by a factor of 5%, consequently preventing over-reporting of Green House Gas (GHG) emissions and assisting with Tier 3 compliance.

An aegex10™ intrinsically safe tablet constitutes a hazardous area approved interface with the meter allowing personnel to monitor data and analytics in real time.



FlareMaster DataFlow is a data gathering and analysis tool which can be used in conjunction with the EDM hardware. DataFlow facilitates remote interrogation and parallel monitoring of multiple FGMs from a safe area as depicted by the topology diagram on the following page. The operator is provided with a real time display of process data, including mass and standard volume flow, velocity, process temperature and pressure. Historical records of measured and calculated data are easily accessible.

# AN EXTENDED VELOCITY, DUAL REDUNDANCY SUPERVISORY SYSTEM, FLAREMASTER AT A GLANCE

- ▶ Designed to enhance the performance of the current generation of ultrasonic flare gas meters
- ▶ Sustainability of measurement under process challenges that would defeat standard meters
- ▶ Effective operation during significant gas density variation
- ▶ Potential for decrease in reported flare totals and consequent financial penalties
- ▶ Reduced measurement uncertainty
- ▶ Unaffected by gas stratification
- ▶ Immune to transducer contamination
- ▶ Flow velocity up to 1000m/sec
- ▶ Can be installed on a “live” process with no shutdown necessary
- ▶ Primary flare gas meter can be interrupted for service and maintenance without loss of measurement
- ▶ Dual redundancy of measurement
- ▶ Real time display of process data, including mass flow and standard volume flow, totalised flow, velocity, process temperature and pressure



# TOPOLOGY DIAGRAM

## Flare Gas Meters

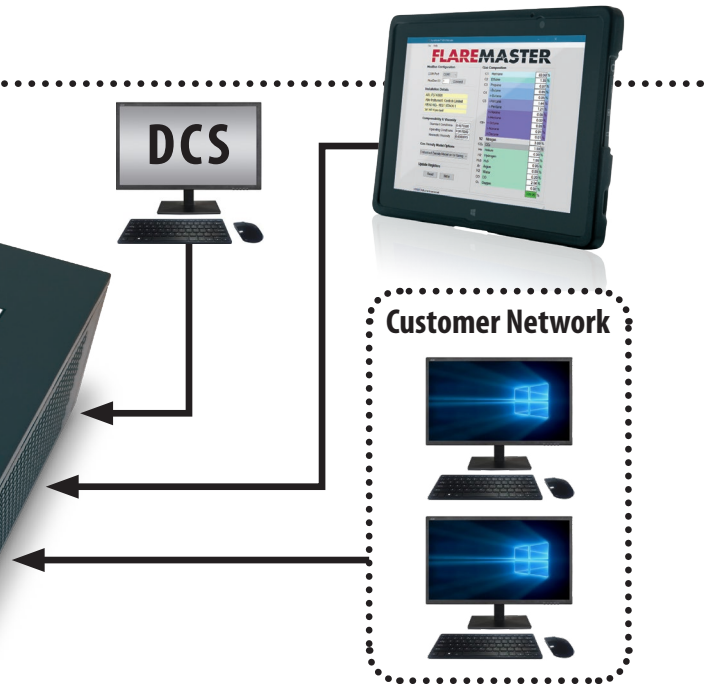


**FlareMaster System Option I** incorporates a state-of-the-art compact processor which facilitates dynamic gas compressibility adjustment, an extended velocity range and comprehensive communication protocol selection.

**FlareMaster System Option II** equips the FlareMaster with a supplementary, non-invasive sensor array which confers

For more information regarding ABLE's FlareMaster, please visit <https://able.co.uk/product/flow/able-flaremaster/>

## Aegex Tablet (ATEX Certified)



additional redundancy and an advanced software feature set. This imbues the FGM with sustainability of measurement and optimum accuracy under all process conditions, including extreme flare stack blowdown, which can involve flow velocities of up to 1000m/sec. In this configuration, the FlareMaster provides the full dual redundancy, supervisory system referenced above.

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