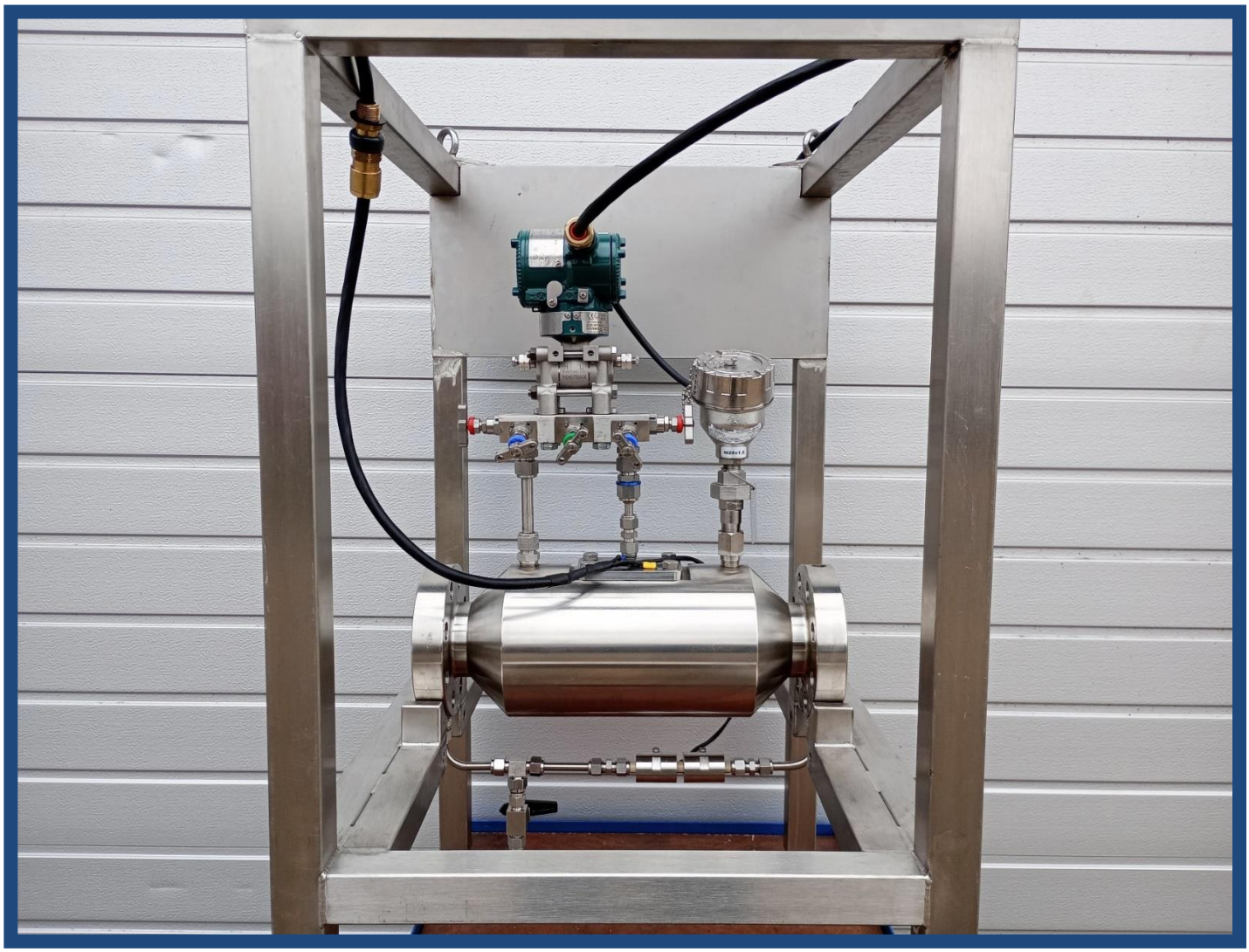
Multiphase Flow Meters and Sampling Solutions for the Oil & Gas Industry

Petroleum Software Ltd

esmerGSE™

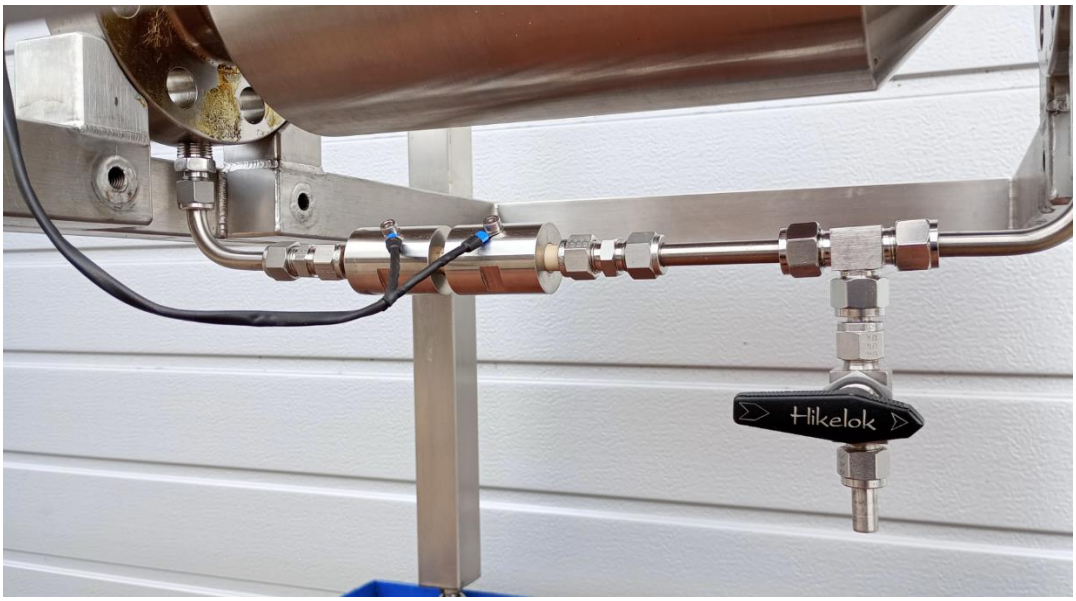


esmerGSE™ Overview

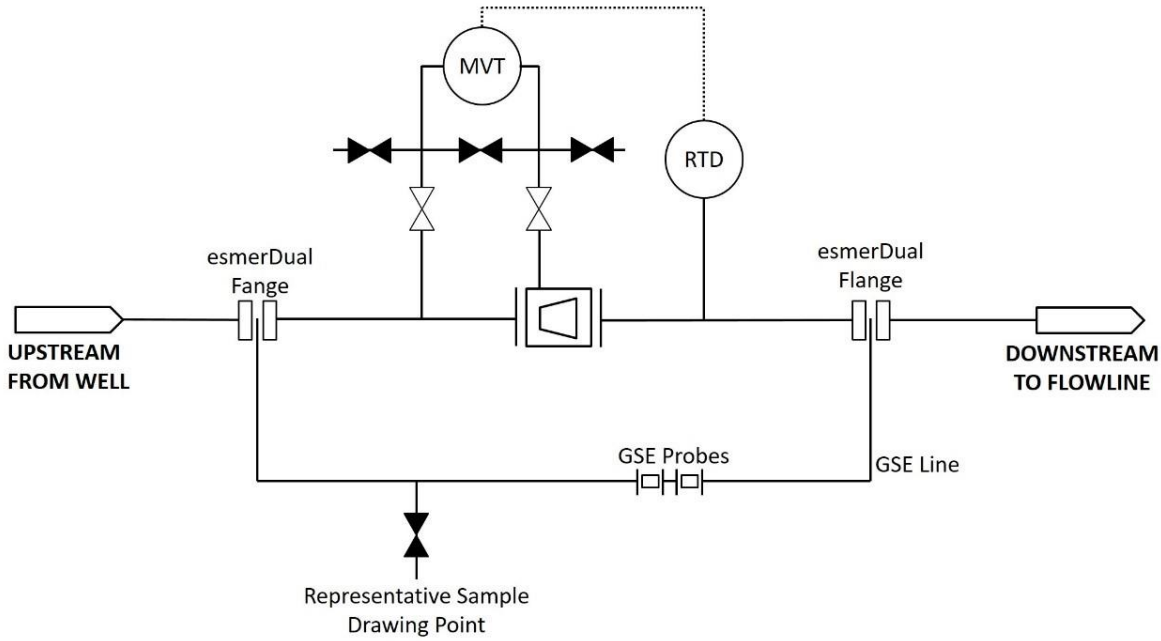
esmerGSE™ is an innovative low cost multiphase flow meter for measuring the flow rates of all phases in oil and wet gas production lines across the full GVF and water cut range without the need for separation or complex sensor technologies.

esmerGSE™ uses a conventional venturi for total flow rate measurement and a bypass line for watercut measurement (with option for sampling). The impedance of the liquid phase flowing through the bypass can be measured and converted to watercut by means of the esmerMux™ impedance transmitter.

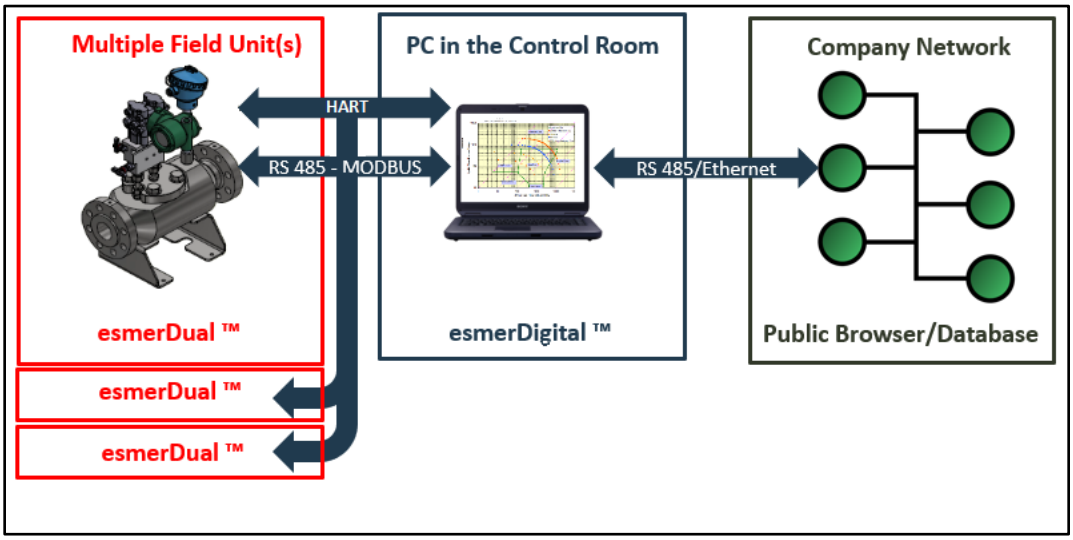
Data acquisition, computation and communication are carried out by the esmerDigital™ software which runs on industry standard Windows PCs. esmerDigital™ interfaces to esmerGSE™ via RS485 and MODBUS protocol. Calculation of the flow rate of the individual phases are founded on a combination of fluid dynamic and thermodynamic models and signal processing technologies.



PID

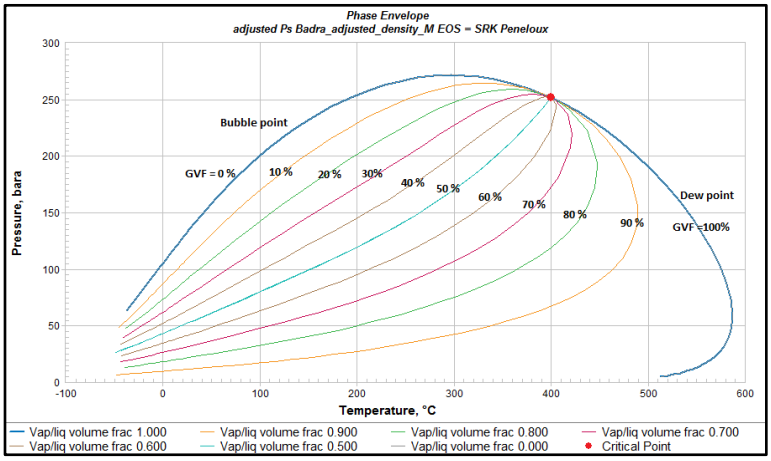


Wiring and Connectivity



For wiring, a 24V cable and an RS485 digital cable is required between the field unit(s) and the PC in the control room. I/O tasks, including network connection for output, are implemented on the RS485- Ethernet- Modbus platform. Multiple field units can be controlled from a single PC in the control room.

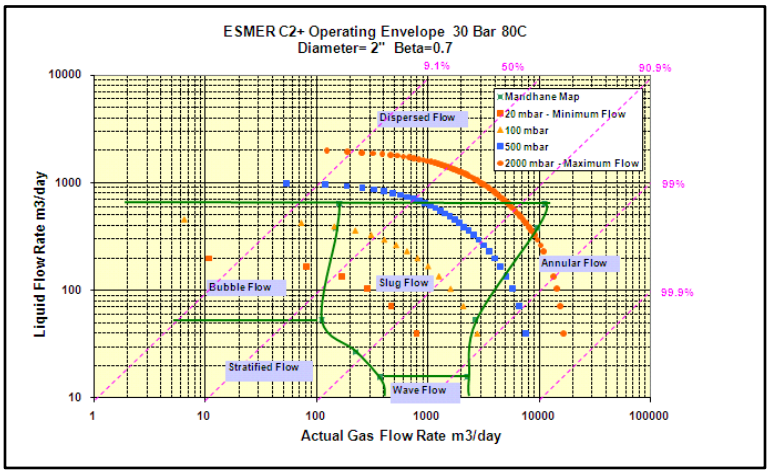
esmerGSE™ – How Does It Work?



Processing and I/O tasks are carried out on the Windows PC by esmerDigital™ application software. Fluid dynamic and thermodynamic (equation of state – EOS) mathematical models are executed in real time to measure and transmit the flow rates of phases.

Initial model for the coefficient of discharge (C_d) of the cone is based on multiphase flow loop tests. Initial model for EOS is based on PVT data provided by the user. C_d and EOS models are "tuned up" in-field to match the process conditions by means of the esmerConfigurator™ application software. We make use of separator and/or esmerGSE™ by-pass sample for tuning up the factory calibration.

The procedure and the tools provided for field calibration are in compliance with API 2566 guidelines. Petroleum Software Ltd. has a long track record of testing and applying the tune up methods in the field.



Range

Flow Range: Sized to suit given process conditions.
Water Cut: 0 – 100%
GVF: 0 – 100%
Pressure: up to 150 bar
Temperature: up to 140˚C
Materials and rating: To suit given requirements.

Accuracy

esmerGSE™ calibration will be tuned up to field conditions. Accuracy will depend on PVT data quality and process conditions. A specific accuracy target will be provided for each application.

Weight and Dimensions

Typical dimensions and weights (ANSI 600)				
Size	**L (cm)**	**H (cm)**	**W (cm)**	**WEIGHT (kg)**
2”	55	110	70	90
4”	70	110	75	100
6”	85	110	80	120