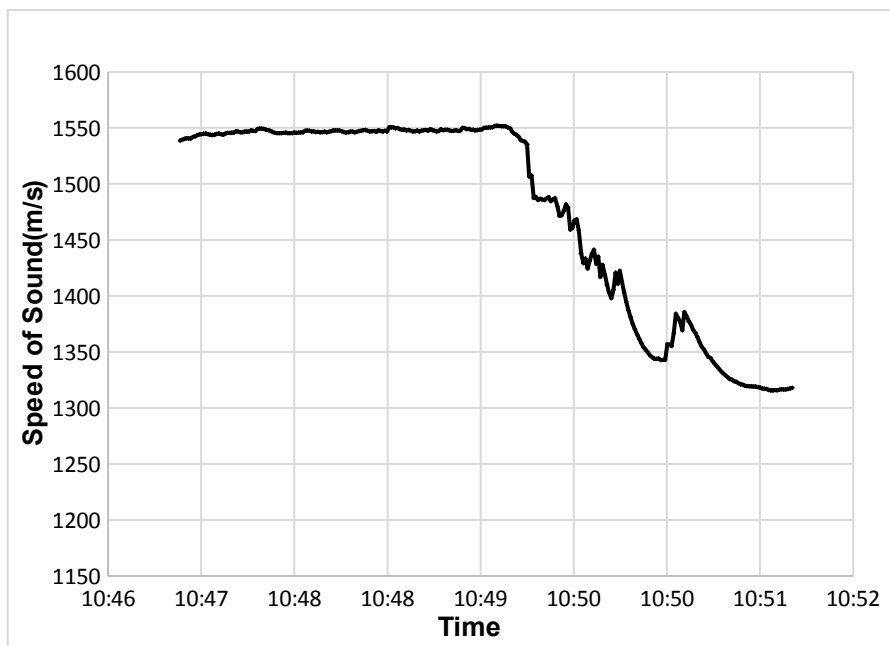


Case Study, Sonic Driver Ltd, Ultrasonic clamp-on flowmeter, Interface Detection, Oil Pipeline.

A fixed installation flowmeter was installed on an oil pipeline for extended tests during the first 6 months of 2021.

The flowmeter was configured for interface detection using its standard Phase Detection mode of operation. Given a knowledge of the speeds of sound in 2 fluids, for example water and oil, the unit can be programmed to continuously monitor speed of sound and to trigger an event, such as operating a relay, when a user programmed threshold is crossed.

Over the period the flowmeter measured and recorded both flow and phase information, figure(1) shows a typical trend as an interface passes.



Figure(1) Passage of a Water/Oil Interface

Comparative measurements were taken at spot check intervals, see table(1).

	Water (m/s)	Oil (m/s)
Sonic Driver	1530	1300
Other	1523	1306

Table(1) Comparative Measurements

This extended site trial provided much useful information for on-going product development and put the flowmeter control unit and its sensors through a full range of environmental conditions with piping up to 55 degrees centigrade in daylight and freezing at night.

This Phase Detection capability lends itself to other industrial applications in fields such as food and pharmaceuticals where different liquids are being mixed and a knowledge of speed of sound can be used to indicate, ratio, and state of mixing, emulsion, etc..

The measured speed of sound can also be output as a 4... 20mA signal and/or over Modbus RTU depending which input/output options have been fitted in the meter. Optionally a PT100 input can be used to compensate measurements for changes in temperature.