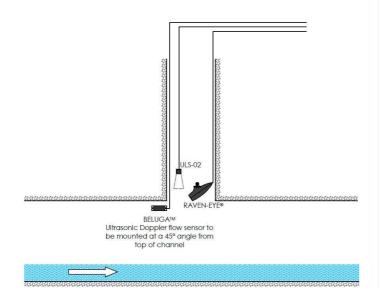
HYBRID SYSTEM

Hybrid flow measuring system



RAVEN-EYE® + BELUGA

When the flow conditions be measured are making it impossible to accurately and reliably measure the flow rate under every flow conditions, a hybrid system could be required.

Generally the dry weather flow rates can be measured very accurately and reliably with the combined Area/Velocity non-contact RAVEN-EYE® flow meter and an ultrasonic level measurement.

However both non-contact ultrasonic level and radar velocity signals need an air to water interface, which they lose as soon as the channel is under surcharge conditions, meaning that the ultrasonic level and radar velocity signals disappear.

The BELUGA $^{\text{TM}}$ Area/Velocity Doppler flow meter combined to a pressure level sensor can take the relay of the non-contact flow measurement solution when the site to be measured is under surcharge.

The use of wetted and non-contact sensors makes it a reliable and maintenance free system. The wetted sensor (i.e.: BELUGATM) is usually installed higher in the channel. Therefore it is not impacted by water charged with debris and with a high turbidity. For those conditions, the non-contact radar sensor measures the flow velocity.

A hybrid system becomes really interesting when one single technology cannot measure with satisfaction under the different flow conditions of the site.



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The hybrid solution from FLOW-TRONIC associates a non-contact ultrasonic level and pressure sensor for level and non-contact RADAR (RAVEN-EYE®) with ultrasonic Doppler (BELUGA $^{\text{TM}}$) for velocity, all connected to a single converter.

During rain events, water is usually rising and can in certain circumstances fill the channel. In those surcharge conditions, the radar velocity signals disappear and the wetted sensor becomes the master unit to measure flow.

The advantage to position the wetted sensor higher in the channel is that water during those events is usually more diluted. Thus it requires no regular cleaning maintenance.

FLOW-TRONIC has been gathering lots of experience with difficult applications along with hybrid flow meters installed amongst others on large storm overflows in collection systems. It became quickly obvious for FLOW-TRONIC that switching from one technology to the other at a crossover point resulted in bad flow measurements.

This is the reason why FLOW-TRONIC developed a new patented flow calculation algorithm allowing a smooth progressive back and forth transition from one to the other, mixing maximum information from each technology when the technology is best performing.







Combination of wetted and non-contact flow sensors

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