

# YTA

# sonic-PLT



## Integrated Flow and Wellbore Diagnostics

In tough environments such as in extended reach horizontal or open hole completion wells, existing Production Logging Tools (PLT) with spinners, protruding sensors, bow spring centralisers and multi-arm calipers are often damaged or unable to reach out to enlarged hole sizes, resulting in inadequate or no data collection.

YTA's Sonic-PLT is the world's first spinner-less and contact-less fully integrated PLT and has been designed specifically to tackle the challenges of collecting flow and well condition information in tough environments. It has no moving nor protruding parts, is fully integrated, is robust, reliable and very resistant to downhole harsh challenges, resulting in much more efficient and successful well diagnosis, which is invaluable for production optimization.

The truly innovative and revolutionary Sonic-PLT is protected by both utility and design patents (pending) globally.

### ▶ Operating Principle

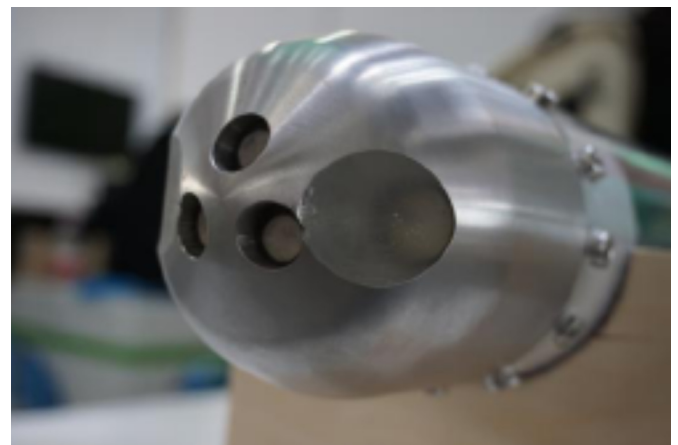
The Sonic-PLT uses a range of specially developed ultrasonic and electrical transducers in combination with proprietary software algorithms to determine the flow and the wellbore conditions, creating an integral view of the downhole dynamic environment in the well.

Sensors embedded around the circumference of the tool record borehole size, shape, the presence of produced solids, the presence of relative volumes of conductive (i.e. water) and non-conductive (i.e. hydrocarbon) phases, and the presence of relative volumes of gaseous and liquid phases, to establish water and gas holdup in the flow. A gamma ray (GR) detector records naturally emitted gamma radiation from the formation which is used for depth correlation against a reference GR log of the well, a casing collar detector records CCL information.

Pressure and temperature data are recorded at high frequency to aid in identification of points of gas and / or water inflow into the well.

### ▶ Data Interpretation

The Sonic-PLT provides data in industry standard LAS 2.0 format and can be imported readily into industry standard PLT interpretation packages such as Kappa Emerald® for full 3 phase interpretation.



Sonic-PLT nose design

### ▶ Options

- Sonic-PLT mini (single phase) 90mm ready to be deployed
- Sonic-PLT mini slim version 54mm under sustaining engineering
- Sonic-PLT multiphase under development

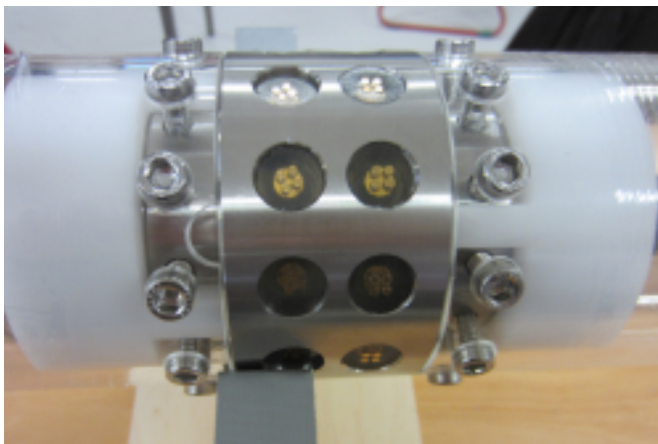
## ► Features

- No spinners or protruding parts to get stuck or break off
- Memory mode (slick-line, CT) or e-line conveyed
- Can be deployed in vertical, deviated or horizontal wells
- Cased and/or Open Hole
- Pressure, Temperature, GR, Caliper, Hold-up, Flow Rate, borehole size and shape, status of downhole completion items such as sleeves, ICD's
- Borehole size measurement can reach up to 15" diameter

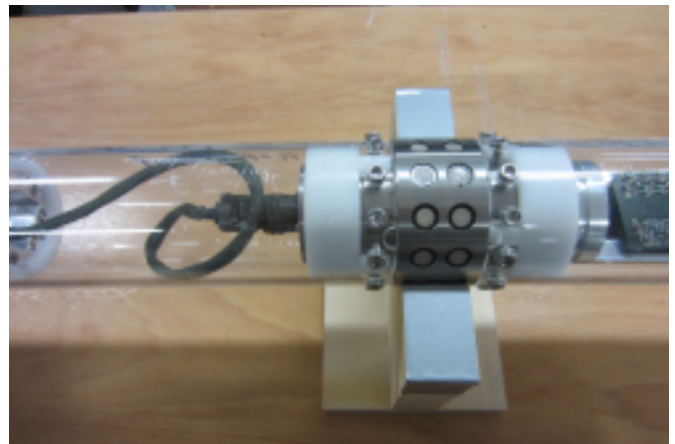
Specifications	Prototype	Production Version
OD	90mm (3.54")	90mm (3.54"), 54mm (2 1/8")
Sensors*	Ultrasonic module, electrical module**, gamma module, pressure and temperature module	
Temperature rating	85°C (185°F)	150°C (300°F)
Pressure rating	70MPa (10,000psi)	Higher rating to be tested
Tool length with all modules e-line version	7.60m (25ft)	54mm slim version to be determined
Tool length with all modules memory version	6.03m (19.8ft)	54mm slim version to be determined
Tool weight with all modules e-line version	205kg (452lbs)	54 mm slim version to be determined
Tool weight with all modules memory version	180kg (397lbs)	54 mm slim version to be determined

\* Sensors are designed to sit in separate and independent modules. Module selection can be tailored to end user requirement.

\*\* The electrical module for multi-phase Sonic-PLT is still under development. Single phase -Sonic-PLT mini -with all other modules, is ready to be deployed in the field.



**Sonic-PLT electrical sensor module module**



**Sonic-PLT ultrasonic sensor**

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