



TECHNOLOGIES

DOWNHOLE INNOVATION

BMST LOGGING TOOL Battery and Memory Module

Description

This module (BMST) is part of a production logging tool (PLT) and is used in combination with different other sensors to obtain measurement records in oil / gas / water wells allowing to generate reports of profiles, gradients and stations.

The BMST is used when the PLT is lowered into the well by a non-conductive wire (usually a slickline), the data is stored in non-volatile memory to be downloaded once the job is done via an interface with the PC. The software then allows to visually verify the data combine them with depth records, filter them, sort them etc. and generate ASCII files for later analysis.

When used with a conductive cable, the BMST is replaced by a telemetry cartridge (TCST) using the same sensor modules and allowing real-time acquisition.

Benefits

Because it has non-volatile memory, data is maintained even without power.

Programmable sampling frequency, long life lithium batteries (Typical 50hs depending on the connected modules).

Technical Specifications	
Acquisition Software	Memlog PLT (Windows 7/8/10/11)
Communication	USB Interface
Max. Operating Temperature	150C
Sampling rate	Up to 15 samples/sec
Real Time Clock	YES (builtin)
Memory Capacity	Typical 1M
Mechanical Specifications	
Diameter	43 mm (1-11/16") 38 mm (1-1/2")
Length	995 mm (39)
H2S Resistant	YES
Operating Pressure	1000 bar / 15k psi





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PSST LOGGING TOOL Pressure Temperature and CCL Module

Description

This module (PSST) is used to obtain measurements of pressure, downhole temperature and casing couplings (CCL).

It can be combined with a telemetry module (TSCT) for real time readings or with a memory and battery module (BMST) if non-conductive wire is used.

Technical Specifications	
Transducer Type	Piezoresistive (standard) Quartz (optional)
Pressure accuracy	Typical 0.03% (0.05% long term)
Pressure Resolution	Typical 0.025 psi (0.01 psi for quartz)
Transducer Calibration Range	10K psi or 15K psi
Pressure Probe Type	PT-100 CLASS AA
Temp. Response Time	2 secs
Temperature Error	Max. 1 °C for the whole range
Temperature Resolution	0.001 °C
CCL Type	Coaxial Coil
Magnets	Rare Earth
CCL Signal Sampling	60 hz (four channels)
Mechanical Specifications	
Diameter	43 mm (1-11/16") 38 mm (1-1/2")
Length	650 mm (25.6")
H2S Resistant	YES
Operating Pressure	1000 bar / 15k psi
Operating Temperature	150 °C
Acquisition	Telemetry / Memory





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WHST LOGGING TOOL Capacitance Water Hold up Module

Description

The capacitance module (WHST-B) is used to obtain the ratio of water to the hydrocarbon continuously and thus obtain the "water hold up" at all depths.

This tool can be run in combination with other modules and especially with the pressure-temperature-CCL (PSST-B) to perform analysis in the presence of three phases and thus quantify the production of the well as the tool passes through the producing areas.

Other uses of this tool are as loss identification and level measurement in abandoned wells.



Technical Specifications	
Transducer Type	Coaxial Capacitor
Water Hold-Up (practical range)	0 - 40%
Accuracy	1% F.S. (when temp. compensated)
Resolution	Better than 0.1% F.S.
Measurement Unit	CPS or Hz
Sampling Rate	15 samples/sec
Mechanical Specifications	
Diameter	43 mm (1-11/16") 38 mm (1-1/2")
Length	560 mm (22")
H2S Resistant	YES
Operating Pressure	1000 bar / 15k psi
Operating Temperature	150 °C
Acquisition	Telemetry / Memory



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GRST LOGGING TOOL

Natural Gamma Ray Module

Description

The gamma-ray measurement module (GR5T-B) provides the instantaneous count equivalent to the level of natural gamma rays emitted by the formation at all depths. Natural radiation emissions come from elements such as uranium, thorium and potassium that are found in different concentrations at different depths 10 years long from the measured well. These natural "radioactive markers" do not vary or do so very slowly over time (except for those areas being produced) and can be considered as a pattern that can be correlated in successive measurements of the same well (and even between nearby wells), being very useful when determining the depth of the different areas.

This tool can be run in combination with other modules and especially with the pressure - temperature-CCL module (PSST-A) to accurately determine the depth of termination and / or casing (it is often even possible to detect punctured areas) with respect to logs made in open hole.

Technical Specifications	
Transducer Type	PMT+Nal(Ti) Crystal
Range	0 – 65000 API
Accuracy	5% of reading
Resolution	1 API
Measurement Unit	Gamma Ray API
Sampling Rate	15 samples/sec
Mechanical Specifications	
Diameter	43 mm (1-11/16") 38 mm (1-1/2")
Length	766 mm (30.2")
H2S Resistant	YES
Operating Pressure	1000 bar / 15k psi
Operating Temperature	150 °C
Acquisition	Telemetry / Memory



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FSMT - LOGGING TOOL Series Fullbore Spinner flowmeter sonde



Description

This tool (FSMT) is used to obtain flow measurement in casing in producing wells or injectors. It can be used to generate reports with production profiles or to control the correct operation of plugs. It has a deployable impeller that rotates with the fluid obtaining high resolution fluid direction and velocity data. It allows detection of low production flows (fluid velocities less than 1m/min in liquids and less than 2m/min in gas) with records running in and out the well to achieve greater sensitivity. The tool collapses completely to allow passage through tubings or restrictions and opens once inside casing. Available for different casing sizes.

Technical Specifications		Mechanical Specifications	
Range	+/- 250 RPS	Diameter	43 mm (1 -11/16") 38 mm (1 -1/2")
Resolution	0.1 RPS	Length	700 mm (27.5")
Max. Temperature	150C	H2S Resistant	YES
Max. Pressure	1000 bar (15k psi)	Casing Range	4.5" to 9.625"

SCST LOGGING TOOL Spinner Electronics Cartridge



Description

This module (SCST-B) uses frictionless Hall-effect sensors to obtain direction readings and high resolution speed from both spinner for tubing (CSMT) and casing (FSMT). It can be combined with a telemetry cartridge (TCST) or with a battery and memory module (BMST) for the case of using non-conductive wire.

Technical Specifications		Mechanical Specifications	
Range	+/- 250 RPS	Diameter	43 mm (1-11/16") 38 mm (1-1/2")
Resolution	0.1 RPS	Length	350 mm (13.8")
Sampling Rate	15 Sample/sec	H2S Resistant	YES
Max. Temperature	150C	Acquisition	Telemetry/Memory
Max. Pressure	1000 bar (15k psi)		

CSMT - LOGGING TOOL Series Continuous Spinner flowmeter sonde



Description

This tool (CFS) is used to obtain flow measurements both within tubing and casing in producing or injectors wells.

It can be used to generate reports with production profiles or to control the correct functioning of mandrels or plugs.

It has a shrouded spinner that rotates with the flow obtaining data for direction or speed of the fluid at high resolution .

Detects low production flows (fluid velocities less than 3 m/min in liquid or less than 6 m/min in gas) with records running in and out the well for greater accuracy .

Technical Specifications		Mechanical Specifications	
Spinner Type	Turbine	Diameter	54 mm (2-1/8") 43 mm (1-11/16") 38 mm (1-1/2")
Range	+/- 250 RPS	Length	204 mm (8")
Resolution	0.1 RPS	H2S Resistant	YES
Max. Temperature	150C	Tubing Range	2.375" to 4"
Max. Pressure	1000 bar (15k psi)		

SCST LOGGING TOOL Spinner Electronics Cartridge



Description

This module (SCST-B) uses frictionless Hall-effect sensors to obtain direction readings and high resolution speed from both spinner for tubing (CSMT) and casing (FSMT).

It can be combined with a telemetry cartridge (TCST) or with a battery and memory module (BMST) for the case of using non-conductive wire.

Technical Specifications		Mechanical Specifications	
Range	+/- 250 RPS	Diameter	43 mm (1-11/16") 38 mm (1-1/2")
Resolution	0.1 RPS	Length	350 mm (13.8")
Sampling Rate	15 Sample/sec	H2S Resistant	YES
Max. Temperature	150C	Acquisition	Telemetry/Memory
Max. Pressure	1000 bar (15k psi)		