

Memory Logging System

OVERVIEW

The Memory Logging System is used where wireline conveyed real-time logging may not be realized. The downhole memory tools are deployed by slickline, coiled tubing/tubing or tractor and logged, with the data being temporarily stored in the memory. The data is retrieved for playback, and further processing at the surface after logging is completed. The Memory Logging System may be used in production logging, casing corrosion evaluation and cement bond evaluation, etc.

LOGGING PROCESS

WellRay Memory Logging System is composed of the surface equipment (a PC, a Memory Control Module, and a Time Depth Recorder) and the downhole tools (a Battery Cartridge, a Memory Tool, a Real-time Clock and other sensing tools). The PC is connected to the Memory Control Module via a USB port and installed with the MemLog™ software through which the operator may send commands to the Memory Control Module.

The Memory Control Module is connected to the Battery Cartridge, and then to the Memory Tool, depending on the commands from the PC, the Memory Control Module anti - passivates the batteries in the Battery Cartridge or downloads data from the Memory Tool.

The Time Depth Recorder is used to record in real-time and display the logging time, depth, line speed, and tension.

The Battery Cartridge and the Memory Tool are respectively used for powering the sensing tools and storing the measurements.

The Real-time Clock transmits the standard real-time clock to the memory cartridge with an internal real-time clock chip for correlating depth with data.

The other sensing tools are used to measure and acquiring data.

FEATURES

- ❑ 512MB / 1GB / 4GB capacities
- ❑ Standard threads for free combination
- ❑ Standard tool bus protocol- WRTbus, compatible with real-time logging tools
- ❑ 1 3/8", 1 11/16" and 2 7/8"
- ❑ Sampling rate and sampling interval may be preset
- ❑ Able to customize as per customer requirements

Downhole Memory Control Panel (DMCP)

OVERVIEW

The Downhole Memory Control Panel (DMCP) is an integral part of WellRay Memory Logging System. The DMCP is mainly used to:

- ▣ Interface with the PC via a USB port to receive commands from the surface;
- ▣ Connect with the Battery Cartridge and the Downhole Memory Tool to follow the commands either to de-passivate the battery pack or to access to the logged data as per the commands sent from the PC.

FEATURE

To measure the tool current and battery voltage.



SPECIFICATIONS

Parameters	Description
Working Temperature	0 - 50°C
Operating Voltage	14-18VDC (recommended)/ 20VDC (max.)
Operating Current	50 mA
Battery (Depassivated)	Switch on: battery voltage < 14.5VDC
	Switch off: auto, battery voltage > 16VDC
	Manually, battery voltage > 1VDC
Battery Indicating Light	Green (normal, voltage > 14 ± 0.5VDC)
	Red (low, voltage < 13 ± 0.5VDC)
Power Indicating Light	Green (power on)
LCD Display	Voltage (V)
	Current (mA)
Connection to PC	USB3.0
Connection to Battery	2.5mm DC mono-pin socket
Tool Connection	9 pin D-type Socket

Time Depth Record Panel (TDRP)

OVERVIEW

The Time Depth Recorder is used to record in real-time and display the logging time, depth, line speed, and tension.

FEATURE

- Auto switch between internal power of alkaline and lead-acid battery
- External AC or DC power
- External links to multiple parameters with internal 7 analog channels
- Built-in real-time clock



SPECIFICATIONS

Parameters	Description
Max Working temperature	0 - 50°C
LCD	7" Touch TFT LCD hi-brightness Screen, 1280×800 pix
Control	Parameters input and functions selection
	LCD Brightness control
	Power on/off
Status LED	Green LED indicates logging and collecting status.
	Red LED indicates alarm or erasure operation.
Clock	Display the real-time clock
Memory	A 4GB NVM is provided, enabling to purely record depth data for 23000 hours, or record the depth and all 8 analog channel data for 8750 hours.
Communication interface	USB 3.0
	5.0Gbps max.
Power source	4 D-type cells
	External 12-24V DC External 100-250VAC
Depth interface	Providing +5V and +12V power supply, and receiving orthogonal depth signal

Downhole Battery Cartridge Sub (DBCS)

OVERVIEW

The Downhole Battery Cartridges Sub (DBCS) provides the power supply to the tool string from an internally mounted high-temperature battery pack, which consists of 5 cells with the compact structure for easy replacement.



SPECIFICATIONS

Parameters	Description
OD	φ43mm / φ35mm
Max Working Temperature	150°C
Max Working Pressure	100MPa
Battery Model	3B3700/ PMX150C
Performance Rating	High
Cell Size	C type
Number of Cell	5
Cell Composition	Lithium Sulfuryl Chloride
Voltage Rating	3.9 VDC cell / 19.5 VDC pack
Battery Capacity	6.2AH
Continuous Discharge Current	Max 500mA

Downhole Memory Cartridge Sub (DMCS)

OVERVIEW

The Downhole Memory Cartridge Sub (DMCS) is used to store the measured data from downhole logging tools in the internal memory chip in a way predefined by the memory control module.

It is also used to access the data through the memory control module for subsequent processing.



SPECIFICATIONS

Parameters	Description
OD	φ43mm/ φ35mm
Max Working Temperature	175°C
Max Working Pressure	80MPa
Working Voltage	13.5-20VDC
Standby Current	2mA
Working Current	15-30mA
Data Download Rate	4MB/min (with a computer)
Sampling Rate	20ms~24hr, 20ms increment, programmable for each tool /job
Channel Quantity	up to 62
Tool Bus	WRTbus
Memory Capacity	512MB /1GB
Communication Rate	500Kbps

Real-Time Clock Sub (RTCS)

OVERVIEW

The Real-Time Clock transmits the standard real-time clock to the memory cartridge with an internally mounted real-time clock chip for correlating depth with the logging data.

SPECIFICATIONS










Parameters	Description
Transmission	WRTbus
Max Working Temperature	150°C
Max Working Pressure	100M P a
OD	φ 43mm / φ 35mm
Working Voltage	+ 18V
Working Current	< 8mA ± 2mA
Measuring Range	The year 2000 - 2079
Accuracy	± 0.26s/day at + 25°C
	± 2 s/day at -40°C to + 125°C
	± 60 s/day at 125°C to + 150°C
Battery Replacement Period	3 year or battery voltage less than 3V
Threads	1-3/16-12UN-2A (B) GO (female/male)



Memory Logging Software (MemLog™)

OVERVIEW

The Memory Logging Software (MemLog™) is used to:

-  Control the Depth Time Recorder and to configure the settings
-  Operate the Memory Control Module to configure the settings for memory tools
-  Check the downhole tools online through the Memory Control Module
-  Calibrate each downhole sensor through the Memory Control Module and save the calibration to files
-  Read the Depth Time Recorder data
-  Read the logged data in the Memory Tool through the Memory Control Module
-  Merge the data from the Depth Time Recorder and the Memory Tool for depth correlation and convert the data to a standard format for test
-  Playback the converted data by following a printable template
-  Output the data in Las, Lis, dLis formats for interpretation in software