



合力科技载波通信系统

HELI TECH CARRIER COMMUNICATION SYSTEM



科技 改变能源 TECHNOLOGY CHANGES ENERGY

Heli Tech Energy Co., Ltd. is Technology Enterprise focusing on solving clients' pain points. Its business covers: R&D and Experiments, Precision Core Component R&D and Manufacture, Intelligent Downhole Tool R&D and Manufacture, Smart Equipment R&D and Manufacture, Geo-Engineering IPM.

Heli Tech Energy Co., Ltd. is a scientific and technological oil service enterprise focusing on technology research and development and application in the field of oil and gas development, undertaking national key R&D projects, and is a national "Specialized Precision and Characteristic" Small Giant Enterprise, national key Small Giant Enterprise, national science and technology enterprise, national hi-tech enterprise, and a leading enterprise of strategic emerging industries in Tianjin, Tianjin Gazelle Enterprise, Tianjin Specialized and Specialized New Enterprises, Vice Chairman of Tianjin Offshore Industry Union, China Scientist Forum Science and Technology Innovation Demonstration Unit, National High-end Downhole Tool Technology Center.

This is a R&D platform created by HELI in order to improve the comprehensive R&D level in conjunction with universities. The laboratory is equipped with 59 large and medium-sized instruments and equipment with a total value of about 100 million RMB.

The R&D team consists of senior experts, technical experts, with technical fields covering mechanical, electrical, intelligent control, communication, Internet of Things and other disciplines.



Heli Energy has extensive experience in industry cooperation The marketing system is spread all over the world

HELI TECHNOLOGY





















Product Overview

In the intelligent era of the Internet of Everything, carrier communication technology is reshaping the boundaries of energy and information integration with disruptive power. As a leader in technological innovation within the industry, Heli (Tianjin) Energy Technology Co., Ltd. has deeply rooted itself in the field of communication. With its self-developed core algorithms and highly stable chip solutions, the company transforms power lines into "smart nerves," achieving the perfect symbiosis of power transmission and data interaction.



Oil Extraction Production Control System

The oil extraction production control system is a crucial component of the oil extraction system. It collects real-time production data from oil and gas reservoirs, monitors the working conditions of the production system, and tracks and alerts abnormal situations, thereby ensuring long-term, stable, and safe oil extraction. Stable and reliable communication is the prerequisite and guarantee for the accurate collection and transmission of oil extraction production status information, as well as for the safe production of offshore and downhole oil. The oil extraction communication system has become a key factor affecting the development costs of oil and gas fields and the lifecycle of oil extraction control systems.



Power Line Carrier Communication Technology

Power line carrier communication technology directly loads signals onto power transmission lines, enabling the simultaneous transmission of power and communication data. It plays a critical role in real-time collection of oil extraction production status information, timely and accurate delivery of control signals to the oil extraction production system, and the supply of electrical power to oil extraction operations. Single-core cables significantly reduce costs and construction complexity, thereby extending the laying distance. As a result, this technology has garnered widespread attention and development within the industry and has become the primary communication method for oil extraction production control systems.







Power Supply and Communication System Based on DC Carrier Technology



System Introduction

Logging while drilling (LWD) typically involves the combined use of multiple tools, such as LWD natural gamma and resistivity logging, azimuthal resistivity logging, acoustic logging, and formation pressure testing tools. Currently, these tools are connected to the mud pulser via communication methods such as 485 or CAN, with the mud pulser acting as the main node to transmit data to the surface. Each tool also draws power from the mud pulser, and the distance between the tools and the mud pulser varies, ranging from tens of meters to over a hundred meters. This results in messy wiring and resource wastage. The power supply and communication solution based on DC carrier technology is designed to address these issues by connecting all LWD tools through a single-core bus, enabling both communication and power supply.

Product Features

This product provides a solution for subsystems (nodes) to share a common communication and power supply system. All LWD tools are modularized and connected to the bus via standard docking rings in a snap-on manner, forming an integrated system. The single-core bus supplies power and facilitates communication for each node in the system.

The modular tools are designed to allow nodes to be added or removed by simply establishing or disconnecting connections. These modular tools provide standardized mechanical and electrical connections. The signal and power connectors consist of an electrically isolated docking ring installed in the groove of the drill string connection. The pins of the modular connector and the junction box share the same contact rings, which are slightly protruding to ensure reliable contact at the connection points. Based on the common power requirements of LWD tools, the bus voltage is set at 33V, which can be adjusted as needed. The power supply and communication system based on DC carrier technology supports a transmission distance of 150 meters and a transmission speed of 10 kbps.

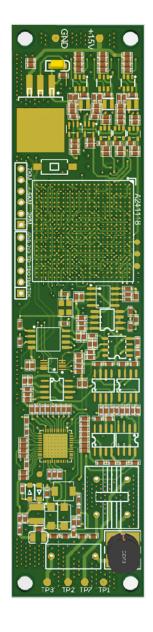
Detailed Data

Bus Voltage (VDC) Transmission Distance (m)

33(Changeable) 150

Serial Communication	RS485,38400,N,8,1	
Transmission Rate	10kbps	
Carrier Frequency	60kHz	

PLC001B8KP Single-Core Cable High-Speed TelemetryCommunication System



System Introduction

The high-speed telemetry communication system for single-core cables consists of a logging telemetry system between downhole equipment and the surface control center. The performance of the logging telemetry system determines the performance of the entire downhole data transmission system. The main function of the logging telemetry system is to transmit the downhole data collected by the logging acquisition system to the surface control center via the cable, while also sending commands from the surface control center to the logging acquisition system. The high-speed telemetry communication system for single-core cables not only solves data communication issues but also transmits power from the surface control center to the downhole equipment for use. This system enables simultaneous transmission of power and data over a single-core cable.

Advantages and Features

- High anti-interference performance, ensuring reliable signal transmission even when high voltage and high current are transmitted simultaneously.
- Transmission rate fully meets the requirements for downhole data transmission.
- Advanced equalization and pre-emphasis technologies compensate for cable attenuation characteris
 tics, restore distorted signals, and reduce inter-symbol interference in the system.



Dimensions	130x30x12mm	Communication Interface	RS485、CAN
Modulation Method	FSK	Power Transmission Input Voltage	15~800AC(VAC)/110~1000DC(VDC)
Ambient Temperature Detection	NTC	Power Transmission Input Current	0~5Arms
Status Monitoring	Temperature	Cable Length	0~7km
Host Computer	Compatible with universal serial port debugging tools/Compatible with universal CAN debugging tools		

PLC001B6KP Single-Core Cable High-Speed Telemetry Communication System



System Introduction

The high-speed telemetry communication system for single-core cables consists of a logging telemetry system between downhole equipment and the surface control center. The performance of the logging telemetry system determines the performance of the entire downhole data transmission system. The main function of the logging telemetry system is to transmit the downhole data collected by the logging acquisition system to the surface control center via the cable, while also sending commands from the surface control center to the logging acquisition system. The high-speed telemetry communication system for single-core cables not only solves data communication issues but also transmits power from the surface control center to the downhole equipment for use. This system enables simultaneous transmission of power and data over a single-core cable.

Advantages and Features

- High anti-interference performance, ensuring reliable signal transmission even when high voltage and
 high current are transmitted simultaneously
- Transmission rate fully meets the requirements for downhole data transmission
- Advanced equalization and pre-emphasis technologies compensate for cable attenuation characteris
 tics, restore distorted signals, and reduce inter-symbol interference in the system



Dimensions	130x30x12mm	Communication Interface	RS485、CAN
Modulation Method	FSK	Power Transmission Input Voltage	15~800AC(VAC)/110~1000DC(VDC)
Ambient Temperature Detection	NTC	Power Transmission Input Current	0~5Arms
Status Monitoring	Temperature	Cable Length	0~7km
Host Computer	Compatible with universal serial port debugging tools/Compatible with universal CAN debugging tools		



Single-Core Cable High-Speed Telemetry Communication System Surface Unit







System Introduction

The single-core cable high-speed telemetry communication system consists of a well logging telemetry system between downhole equipment and the surface control center. The performance of the well logging telemetry system determines the overall performance of the downhole data transmission system. The primary function of the well logging telemetry system is to transmit downhole data collected by the logging acquisition system to the surface control center via the cable, while also delivering commands from the surface control center to the logging acquisition system. The single-core cable high-speed telemetry communication system not only addresses data communication challenges but also transmits power from the surface control center to downhole equipment for operation. It achieves simultaneous power and data transmission over a single-core cable.

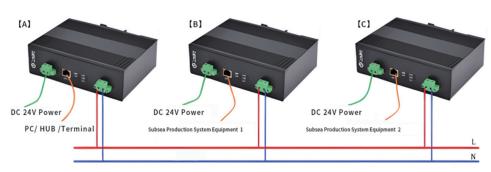
Advantages and Features

- High anti-interference capability, ensuring reliable signal transmission even under high voltage and high current conditions.
- Transmission rates fully meet the requirements for downhole data transmission.
- Advanced equalization and pre-emphasis technologies compensate for cable attenuation characteristics, restore distorted signals, and reduce inter-symbol interference in the system.



Modulation Method	FSK	Maximum transient voltage	16VDC
Ambient temperature detection	NTC	Power Transmission Input Voltage	15~800AC(VAC)/110~1000DC(VDC)
Condition Monitoring	Temperature	Power Transmission Input Current	0~5Arms
Communication interface	RS485、CAN	Cable length	0~7km
Host computer	Compatible with universal serial port debugging tools/Compatible with universal CAN debugging tools		

Subsea Carrier Communication System for Offshore Oil



System Introduction

The subsea carrier communication system is specifically designed for offshore oil applications. With an industrial-grade design, it meets the requirements for stable and high-performance communication in subsea production systems. By utilizing medium and low-voltage power lines, it constructs a data network connecting all user devices linked to the offshore oil subsea carrier system. It supports data transmission and networked communication between offshore platform control rooms and subsea production system equipment. This system is widely applicable for automated control of offshore oil intelligent equipment and subsea production systems.

Advantages and Features

- High transmission rate.
- Long transmission distance.
- FSK signal transmission system based on a fully digital phase-locked loop, ensuring reliable signal transmission.
- Long product lifespan.



Modulation Method	FSK, BPSK.QPSK,OFDM	Maximum transient voltage	30VDC
Ambient temperature detection	NTC	Power Transmission Input Voltage	110~1000DC(VDC)
Condition Monitoring	Temperature	Power Transmission Input Current	0~5Arms
Communication interface	CAN	Cable length	35km
Host computer	Compatible with general CAN debugging tools		



About Us



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