

## The Review of Permanent Downhole Monitoring System

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**Abstract :** With the increasingly difficult development and operating environment of exploration, there are many new challenges and difficulties in developing and exploiting oil and gas resources. These include the ability to dynamically monitor wells and provide data and assurance for the completion and production of high-cost and complex wells. A key technology in providing these assurances and maximizing oilfield profitability is real-time permanent reservoir monitoring. The emergence of optical fiber sensing systems has gradually begun to replace traditional electronic systems. Traditional temperature sensors can only achieve single-point temperature monitoring, but fiber optic sensing systems based on the Bragg grating principle have a high level of reliability, accuracy, stability, and resolution, enabling cost-effective monitoring, which can be done in real-time, anytime, and without well intervention. Continuous data acquisition is performed along the entire wellbore. The integrated package with the downhole pressure gauge, packer, and surface system can also realize real-time dynamic monitoring of the pressure in some sections of the downhole, avoiding oil well intervention and eliminating the production delay and operational risks of conventional surveys. Real-time information obtained through permanent optical fibers can also provide critical reservoir monitoring data for production and recovery optimization.

**Keywords :** PDHM, optical fiber, coiled tubing, photoelectric composite cable, digital-oilfield

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