Drilling Control System in Oil Rigs

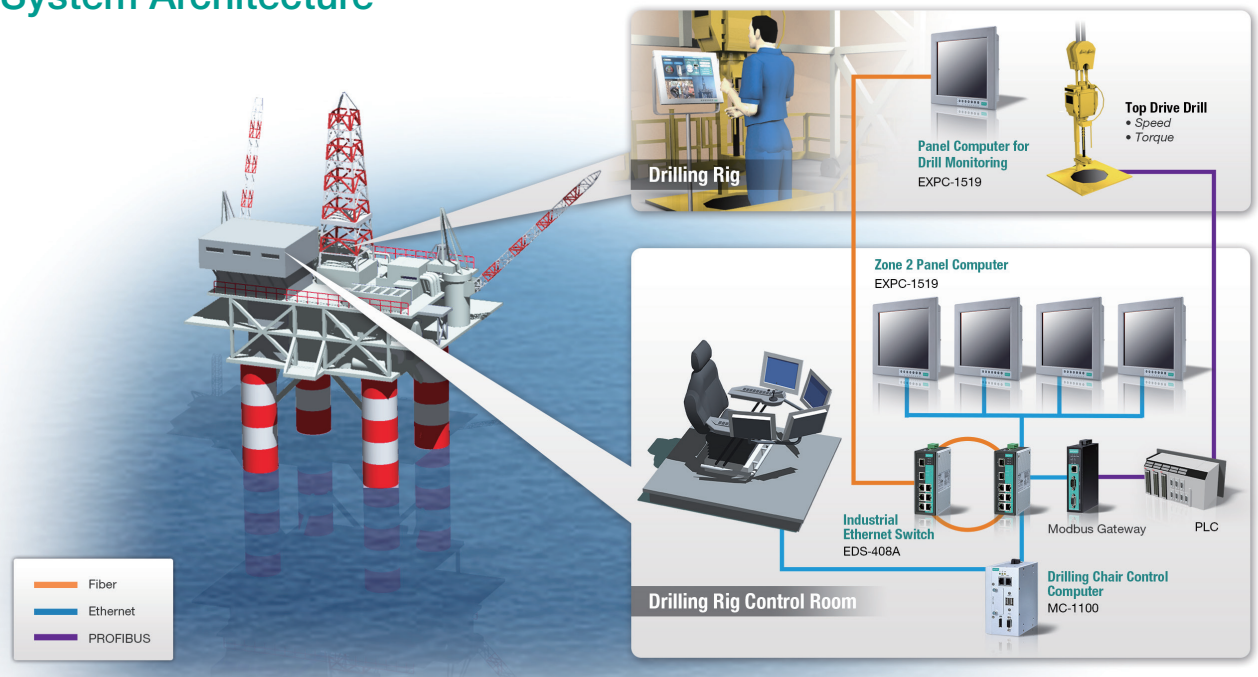
Industry Background

The oil and gas industry is highly dependent on its control systems' ability to visualize and intelligently manage critical processes. Rig and refinery operators have been investing heavily in systems that have the ability to view and control field applications in real time. The installation and use of onsite computers that provide the computing power for these critical systems have always been a challenge. An oil rig or a refinery might be located in a remote location in the middle of the North Sea and its networks of wellheads could be subjected to extreme temperatures and abrasion. Hence, computers that are deployed in these harsh environments must comply with industry performance standards that guarantee their ability to withstand environments with varying high/low temperatures, corrosive elements, and high vibration.

System Requirements

- A single computing platform that can effectively serve a drilling control system
- Zone 2 certification for hazardous locations to guarantee operational safety
- Sufficient computing power to display all information such as drilling speed, drilling torque, and IP surveillance video on the drilling console
- Ability to withstand operations in a wide temperature range, as well as rain, dust, and extreme environmental conditions that are typical of oil fields.
- Robust durable devices to reduce system downtime in the high-maintenance environment of an oil field

System Architecture



MOXA®
Reliable Networks ▲ Sincere Service

Moxa's Solution

A Computer Designed for the O&G Environment

Moxa's EXPC-1519 combines high performance with a rugged design to provide an ideal computing platform for mission-critical operations where onsite control and visibility is the key to success. Its anti-scratch 19-inch sunlight-viewable capacitive multi-touch LCD screen can be operated even with rigger's gloves, which makes the EXPC-1519 an easy-to-use rugged computer for extreme industrial environments.

High CPU Performance

A high performance CPU with Intel® 3rd generation Core™ i7-3555LE or Celeron 1047UE processor that can reach speeds of up to 2.5 GHz guarantees enterprise-grade computing power required for advanced SCADA applications providing intelligence at the field level.

Certified for Reliability in an Oil Field

The fanless design of the EXPC-1519 provides reliable operations in the -40 to 70°C temperature range. This impressive panel computer does not require a heating system during boot up in extreme cold temperatures, placing the EXPC-1519 in a class of its own when it comes to industrial panel computer design. In addition, Class 1 Division 2, ATEX Zone 2, IECEx, and NEMA 4X/IP66 certifications ensure complete protection in explosive environments.

Lower TCO and Complete Flexibility

The dual AC/DC power supply with optional WLAN and 100 M fiber-optic connection allow the EXPC-1519 to integrate reliably and redundantly with your network infrastructure. Additionally, the built-in smart recovery function enables rapid system recovery and data reliability in the case of a system shutdown. The hardware self-diagnostic tool reports the system health status to the central control room so that quick measures can be implemented to reduce system downtime and maintenance costs.

EXPC-1519

ATEX Zone 2 19-inch panel computer

- High performance CPU with Intel® processor, Core™ i7-3555LE, or Celeron 1047UE
- Less than 3 minutes booting time at -40°C, without a heater
- Fanless design with highly efficient heat dissipation, even at 70°C
- Cable-gland design
- Class 1 Division 2, ATEX Zone 2, and IECEx certified

MC-1100 Series

DIN-rail mountable x86 computer

- Energy-efficient Intel Atom E3800 series processor
- -40 to 70°C wide operating temperature range
- Dual storage expansion: SD and CFast slots
- Variety of interfaces: 2 serial ports, 4 Giga LAN ports, 4 DIs, 4 DOs, and 2 USB 2.0 hosts
- Compliance with Zone 2 and marine certifications

EDS-408A

Managed Ethernet switch

- Turbo Ring and Chain (recovery time < 20 ms @ 250 switches) and RSTP/STP for network redundancy
- PROFINET or EtherNet/IP enabled by default (PN or EIP models only)
- Supports MXstudio for easy, visualized industrial network management