

Centralizing Critical Control-Room Computing with KVM Extension

Overview

An oil and gas facility in India sought to improve the physical arrangement of its control-room technology while maintaining dependable access to critical computing systems. Black Box KVM Series KVM extenders were deployed to connect centrally housed servers with operator consoles. The architecture enables operators to interact with remote systems through extended video, keyboard, mouse and other supported signals, while allowing core equipment to remain in a more controlled server-room environment.

Challenges

Demanding field conditions: Heat, dust and the operational demands of industrial control rooms made local placement of computing equipment less desirable. The facility needed to keep operator access convenient without exposing core servers unnecessarily.

Multiple signal requirements: Control workflows called for high-quality display extension as well as keyboard, mouse, USB, audio and serial connectivity for applicable peripherals and alarm-related interfaces.

Security and maintainability: The team needed stronger physical separation between operator areas and critical distributed control system (DCS) infrastructure, alongside practical access for authorized maintenance personnel.

Site-dependent distances: The design needed a point-to-point extension approach with media options appropriate to the cable routes and distances at the facility.

Solution

Central server placement: KVM transmitters connect to computers housed in a dedicated server or equipment room; corresponding receivers provide operator-side access at the consoles.

CATx and fiber deployment options: The KVM family supports different extension media depending on the selected model and site requirements. The deployment description references both CATx and fiber approaches.

Preservation of operator workflows: The solution extends video and supported peripheral signals so operators can continue using their familiar HMI workstations while the associated computers remain remote.

Separation of environments: Moving server hardware away from operator desks can reduce localized equipment heat and noise, while concentrating maintenance activity in a more controlled area.

Key Outcomes

Improved physical separation: The source describes server equipment being located in climate-controlled rooms, reducing its exposure to the conditions of operator areas.

High-quality remote visualization: The original case study reports 4K display performance and low-latency operation for DCS workflows; supported resolution and latency should be confirmed against the exact KVM model.

Simpler service access: Centralized equipment placement can make diagnosis and servicing more straightforward for authorized engineering teams, including Yokogawa maintenance personnel referenced in the source.

Compatibility with existing consoles: The deployment is described as integrating with OWS/LVS HMI stations, preserving established operator interaction patterns.

Support for continuous operations: The architecture is intended for 24/7 industrial environments, helping reduce operational disruption associated with equipment placement and access.

