



Subsea Video Surveillance System

Weatherford's subsea surveillance system provides video and still picture recording, presentation of current and archived still and video files and transmission of real-time video. The system allows you to create a video history of installations, upgrades and repairs or real-time viewing of system operations.

The video and communication system is modular in design with a depth rating of 3281 feet (1000 meters) for aluminum housing or 9843 feet (3000 meters) with an optional titanium housing. The system communicates on copper or fiber optics. The existing power lines are usually all that is needed to create a reliable monitoring system.

The built-in lighting system supplies ample light for deep or murky waters, and optional LED lights provide lighting in extreme circumstances. The video or still picture data is transmitted to the surface where Weatherford's web-based software displays and stores the images. It includes a complete web-based software suite for control, storage and display of image data. The stored images can be tagged for future reference. Surface software also allows the user to remotely control the camera including panning, tilting and lighting changes.

A protection cage shields the camera from damage during installation and operation. The modular design includes a fully customizable mounting device that adapts to even the most unusual subsea structures. Optional add-ons include an ultraviolet (UV) and an infrared (IR) camera in addition to customer specific instruments.





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Applications

Gas and Oil Leak Detection

Leaks do not generally get better with time. They get worse. Detecting leaks in the early stage allows time to develop an action plan to remediate the situation. Many early leaks are undetected by conventional pressure detection means. However, even the smallest bubbles of gas or drops of oil can be seen with the system. By observing these leaks early, action can be initiated to prevent major spills. Alternatively, known leaks in valves or other equipment can be monitored to assure that the leaks are not advancing beyond an acceptable level.

A leakage detection system is giving hydrocarbon leakage alarms. This is based on pattern recognition and image processing. The alarms are presented in the *iScan* presentation system. Without a video surveillance system, surface crews are literally blind in trying to understand the conditions at the subsea equipment. The video equipment provides the eyes for the operator to see the changing conditions of water currents, aquatic life and loose equipment.

Structural Monitoring

With the video surveillance system, operators can monitor the condition of the equipment in real time rather than periodically with remotely operated vehicle (ROV) inspections. Icing, scaling and hydrate growth can be seen accumulating rather than blindly trying to identify the reason for inoperable equipment caused by naturally occurring material that debilitates proper functioning of the subsea equipment.

The integrity of the structure can be monitored regularly and if a structural defect occurs, the operator can see it instantly rather than waiting for the next visit from the ROV. Early attention to structural damage not only can reduce the damage progression of the structure, but also reduces the likelihood of that structural damage progressing toward more catastrophic damage to the entire facility.





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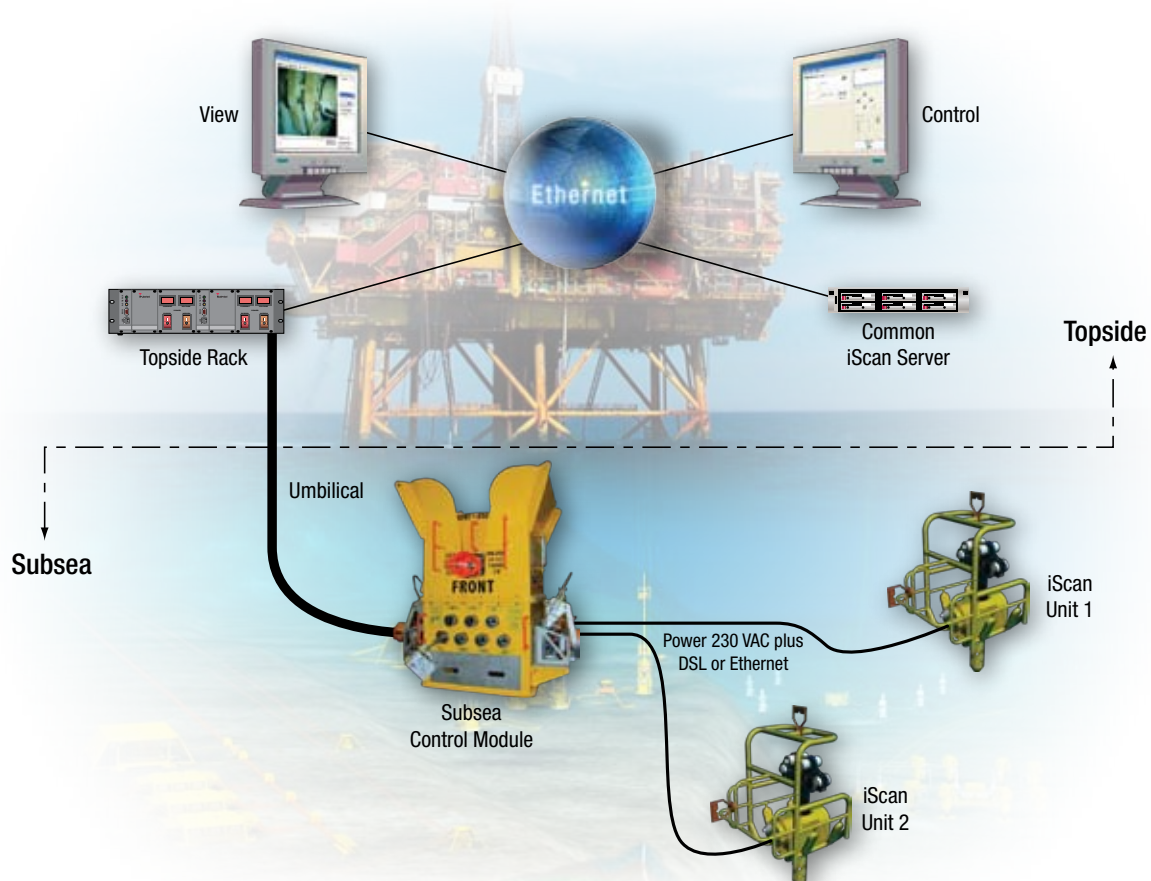
Applications (continued)

Valve Positions

During troubleshooting exercises, visual inspection of valves can be invaluable. With video access to actuated valves, operators have the piece-of-mind in knowing that the valves are where they are supposed to be.

Reduce ROV Inspection Frequency

Constant surveillance replaces the need for many ROV inspections. Since the video is constant and can be recorded, you have access to visual changes to the subsea system without waiting for or scheduling an ROV visit. A snapshot or video history of the equipment provides a valuable tool for comparing the changes in the subsea structure over time.





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Specifications

Camera System	
Format	PAL, 720 x 576 / 25 fps
Compression	JPEG, MPEG4
Still camera resolution	7.7 Mpix
Lens	3.3 to 39.6 mm F1.6/F2.8 (35 mm equivalent: 45 to 540 mm)
Motor control	120 degrees pan 120 degrees tilt
Focus control	Auto focus/manual
Power requirement	180 W
Communication	
Capacity	1 to 30 minutes of video per hour 1 to 10 images per minute
Transmission rate	DSL up to 2.048 Kb/sec Powerline up to 390 Kb/sec
Storage	8 Gb of offline storage
Environmental	
Water depth	3281 ft (1000 m) for standard aluminum housing 9843 ft (3000 m) for optional titanium housing
Temperature, °F (°C)	32 to 104 (0 to 40) operating -4 to 140 (-20 to 60) storage
Mechanical	
iScan unit size with protection cage, in. (mm)	57.5 h x 23.2 l x 43.3 d (1460 h x 590 l x 1100 d)
Weight with protection cage, lb. (kg)	231.5 (105) air 154.3 (70) sea
Housing	Aluminium T6082 standard Titanium optional
Mounting clamps	Several optional mounting solutions (customizable)
Connector	Tronic DigiTron 4-ways standard ODI optional

Options

- Titanium housing for deep water, high pressure operations
- Halogen lights for dark water or long range observation

