Data Acquisition System (DAS) classified for use in ATEX Hazardous Areas

The Orion V ATEX DAS captures and maintains an accurate record of all monitored parameters during a coiled tubing (CT), pumping, acidizing, or hydraulic workover (HWO) operation. The DAS incorporates a see-through pane, so that operators can view critical diagnostic signals without having to open the box. The diagnostic signals provide operators with a quick review of system functionality — giving them valuable troubleshooting information at a glance.

Orion V ATEX Data Acquisition System

Main Features and Benefits

Diagnostics

- System health indicators are visible without opening the door: digital, quadrature and serial I/O module I/O status, and communication indicators.
- IP address and serial number visible on enclosure.
- Available via OrionNET data acquisition software: Serial number and unit description, DAS-disconnected message with troubleshooting tips

- Ethernet-based hardware
- Store and print detailed job events
- Real-time fatigue tracking (Cerberus software required)
- Real-time tubing forces modeling (Cerberus software required)
- Real-time burst/collapse (Cerberus software required)
- Purpose-built for coiled tubing
- Retrofits to existing CT units
- Wireless data transmission

The Orion data acquisition hardware consists of:

- Sensors and cabling*
- Controller box

Electronic Memory Unit (EMU)

- Typical job-log storage capacity > 2,400 hrs.
- Stores diagnostic data
- Channel configuration changes, unit description, and serial number recorded in EMU files
- EMU function internal to PLC
- No user intervention required

Laptop or desktop PC*†

Configuration

The Orion system is modular and can be configured to meet user requirements that are ATEX certified. Up to 48 (including RS485 streams) channels are available for I/O. Depending on the number of channels requested, an additional enclosure may be required. The standard package provides the following minimum channels:

- Speed / Depth
- Tubing weight
- Pipe Heavy / Pipe Light
- Circulating pressure
- Wellhead pressure
- Pump Rate / Volume
- Nitrogen Rate / Volume

* quoted separately, may be provided by customer
† minimum Pentium II - 1.2 GHz processor recommended

Specifications

Feature	Specification
General	
Electronics Enclosure Size	19" W x 19" H x 8" D
Electronics Enclosure Weight	65 lbs. (typical)
Molded Oil-resistant Data Cables	Yes
Enclosure and Cable Gland Ingress Protection	Ip65
Vibration (MIL-STD-810 Highway Trans.)	1.17G RMS, 2 hours per axis
Mechanical Shock (MIL-STD-810 Highway Trans.)	20G, 11ms, 3 x per face
Channel Scaling Applied On Controller/Brain Module	Yes
(increased data integrity between acquisition PCs as well as EMU (Electronic Memory Unit))	
Piecewise Channel Scaling	Yes (up to 30 calibration points per channel)
Operating Temperature	-20° to +40°C (-4° to +104°F), 95% RH (non-condensing)
Storage Temperature	-20° to +70°C (-4° to +158°F), 95% RH (non-condensing)
Communications	
Acquisition Communications Protocol	2 x 10/100Mbs Intrinsically Safe (IS) Ethernet ports
Configurable Acquisition Rate for PCs	Yes (up to 10Hz with OrionNET™)
Supports Multiple OrionNET Connections	Yes (8)
Industrial 802.11 Wireless Access Point	Optional
Orion Software Versions Supported	OrionNET 2.0 and greater
Input/Output Availability	
Channels	Up to 48 (including RS485 streams)
Modular I/O Slots	12
4-20mA Analog Sensor Input with IS Isolators	Yes (up to 4 sensors per module, 2 channels per Ex isolator)
0 to +10Vdc Analog Input with IS Isolators	Optional (up to 4 per module, 1 channel per Ex isolator)
Digital Sensor Input Support (2.5-16V signal) with IS Isolators	Yes (up to 4 per module, 2 per switching Ex isolator)
Quadrature Encoder Support with IS Isolators	Yes (up to 2 encoders per module, 1 per Ex isolator)
RS485 Input with IS Isolators	Yes (2 streams per module, 1 per isolator)
Small Signal Digital Input (magnetic pickups) with IS Isolators	Yes (4 channels per module, 2 per flow-meter Ex isolator)
Configurable Digital Output (requires flameproof protection and cable to other device)	Optional (up to 4 relay or 12V outputs, 2 required for ESS Option)
Other Signals	With appropriate Ex protection such as IS Isolator, Flame-proof design for devices not IS, etc.
Electrical	
Power Input	(typical 110-220 VAC 50 to 60Hz)**
Over current protection methods	Intrinsically safe isolators, and constant short circuit current power modules for internal devices and Ex d attachments
Recessed Contacts Throughout	Yes
Enclosure Cable Glands	Ex e or Ex de cable glands
Hazardous Area Rating	
Protection Type	Ex nA nC [ia Ga] IIC
ATEX Temp rating	T4 Gc (0°C to +40°C)
Equipment Certificate Standard	EN 60079-0:2012 and EN 60079-15:2010

Standard Features

- Laptop or desktop PC-based Graphic User Interface connected to the controller via a standard Ethernet port
- Input power supply options include 10-32 VDC
- NEMA-4X stainless steel enclosure

Available Options

- Sensors
- Brackets, cables, and reels
- Remote Orion Viewer (ROVer)
- Wireless data transmission
- Emergency Stop System (ESS)
- Computer: Standard, "ruggedized" or Hazardous area operation