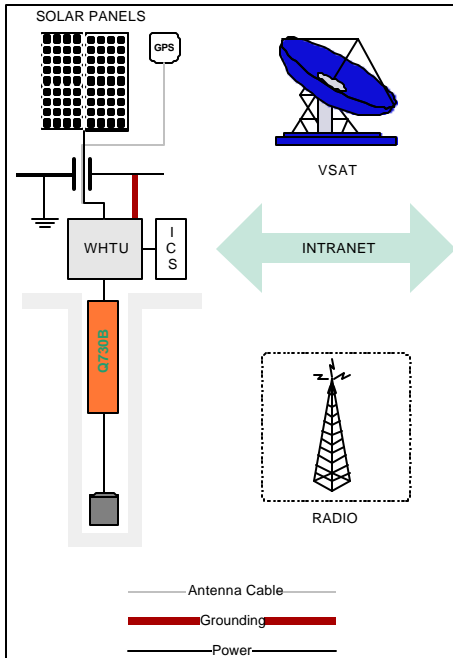


K I N E M E T R I C S

VFSS

VDAS Field Sensor Station



Kinematics' digital Field Sensor Station (VFSS) is a commercial-off-the-shelf (COTS) product addressing the special needs of the nuclear treaty verification community. With extensive experience in system solutions, we recognize the importance of selecting commercial components that satisfy the mission-critical requirements of nuclear treaty verification and global security. This means selecting equipment that works reliably 24 hours a day, seven days a week, year after year.

In the VFSS, we offer state-of-the-art solutions and use components and vendors with whom we have long term relationships based on years of successful performance. The VFSS consists of the Q730B digitizer, Intrasite Communications Subsystem (ICS), Power and Grounding Subsystem (PGS), Wellhead Terminal Unit (WHTU) and cabling.

Digitizer

The Kinematics/Quanterra Q730B-based data acquisition system is an advanced remote real-time broadband data acquisition system that uses Quanterra's patented technology and industry-standard TCP/IP networking protocols. The Q730B analog front-end incorporates Quanterra's patented (US Patent 4866442, others pending) delta-sigma modulator and operates at an oversampling rate of 20kHz, with final output sample rates derived from digital signal processing in the DSP module. This A/D technology consistently outclassed all others in a

side-by-side evaluation at Sandia National Laboratory. Not only does it offer the best dynamic range performance in the industry, it also allows complete flexibility in data rate selection, including multiple sample rates and selectable digital filters with specified characteristics. Based on the commercially proven Q730, the Q730B has been miniaturized and repackaged by Kinematics into a rugged borehole package ideally suited to mission-critical application requirements. For more information on the Q730B, please see data sheets.

Authenticator

Kinematics designed the Q730B to allow easy upgrades to meet the future requirements of the nuclear treaty verification community. The system incorporates a digitizer case intrusion sensor and four additional intrusion alarms. An

Authenticating Data Unit (ADU) can be added in the future to support authentication and alpha packet generation.

Intrasite Communications Subsystem (ICS)

Kinometrics' ICS design provides communication interfaces between the VFSS and the VDAS Data Acquisition Center (VDAC). The subsystem components incorporated offer the highest degree of reliability and flexibility for use under hostile environmental conditions while supporting varied communication topologies required to meet local topographical, infrastructure and regulatory

standards. Our fully tested communication modules transmit data using standard duplex serial interfaces or TCP/IP Level 4 protocol over radio, telephone, fiber optic or satellite communication links. Communication repeater designs are available to support numerous network topologies and physical connections. Please contact Kinometrics for site-specific configurations.

Power and Grounding Subsystem (PGS)

Kinometrics' PGS provides reliable performance that can support VFSS mission-critical operations under hostile environmental conditions. In our experience, power and grounding is normally one of the least considered elements in a VFSS system, and is often the one item where money is "saved" with inadequate design time and equipment. As a system integrator with extensive experience in installations worldwide, we know the danger of neglecting this vital area and consider it an essential element in the successful installation and continued operation of a VFSS system.

Kinometrics was the first to use dual-stage transient protection on all inputs to our recorders

and is one of the only seismic equipment vendors to have CE certification for our recorders and sensors. We have worked hard to ensure our systems are protected from transient damage from lightning or electrostatic discharge (ESD) and do not generate or respond to electromagnetic or radio interference (EMI/RFI). We have worked with specialists from other companies to design optimal protection for the VFSS system as well as building protection circuitry into our equipment. PGS designs are available to support communication repeater designs. Please contact Kinometrics for site-specific PGS configurations for AC, solar, thermoelectric or wind-powered sites.

Wellhead Termination Unit (WHTU)

Kinometrics' WHTU provides easy termination of the downhole cables and connection to the ICS and PGS elements in the box. The unit is internally insulated to provide protection from extreme cold and reduce temperature variations within the enclosure. The enclosure is lockable

and has provisions for installation of an intrusion-detection system. WHTUs can be customized to support existing installation requirements. Please contact Kinometrics for more information on WHTU configurations for specific sites.

Cabling

Kinometrics' cable design is optimized to satisfy the VFSS mission-critical operations that must often operate under hostile environmental conditions.. Cable design ensures that our systems are protected from transient damage from lightning or electrostatic discharge (ESD) and to minimize both EMI/RFI missions and

susceptibility. The VFSS includes all internal cabling and connections to the GPS antenna. The user is responsible for power cabling (when applicable), sensor cabling, and external data connections for systems without RF telemetry. Please contact Kinometrics for site, length, and application specific configurations.