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THE SIERRA SUMMIT

A Newsletter for Customers of High Sierra Electronics

Spring Issue : Volume 16 : July 2012

Product "ALERT"

The ClarifEYEr
Real-Time Video Enhancement

Updating a Legacy System
Papio-Missouri River NRD

Strategies for Monitoring Road Surface Conditions

Did you Know?

The speed of a typical raindrop is 17 miles per hour.

20th ANNIVERSARY
1992 to 2012

Twenty years is a long period of time. It represents 243 months, 7,300 days, or 175,200 hours. It spans 5 presidential terms.

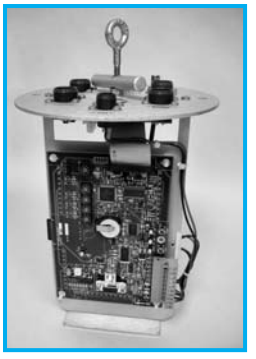
For High Sierra Electronics, 2012 marks our twentieth anniversary of protecting lives and property. In these years we've accomplished a great deal working side by side with our customers. We've designed a number of products, from transmitters to signal converters, to improve day-to-day operation. We've provided clever design improvements in our hardware to simplify field maintenance. We've shared our engineering knowledge and experience in helping to develop ALERT2, and have successfully promoted the value of environmental monitoring for road weather management and improved traffic safety.

At this special time, we want to offer our thanks and appreciation for giving us an opportunity to serve you. We take great pride in our long-standing reputation for business integrity, engineering expertise, product reliability, and professional service. Our mission continues to be public safety through environmental monitoring solutions.

We look forward to the next twenty!

ALERT2
WE'VE GOT YOUR GEAR

The Model 3306-02 ALERT2 Compliant Data Transmitter is available . . . and has all the sensor interface, data logging, and reporting features as our 3306 Transmitter. The 3306-02 adds ALERT2 reporting capabilities through the addition of our ALERT2 modulator board with GPS Receiver.



ALERT2 is the next generation data format for hydrological and meteorological data collection systems. Utilizing faster baud rates for transmission, more data can be sent in shorter messages. This increase in data capacity allows for the transmission of field data in calibrated, floating point engineering units, and also provides a tremendous increase in the number of available station I D's.

Another significant advancement offered by ALERT2 is the ability to assign TDMA time slots to each transmitter in the system which enables exceptional system data throughput even during extreme weather events. This is made possible due to the precise timekeeping enabled by the onboard GPS Receiver. The increased message capacity of ALERT2 also allows for the inclusion of Forward Error Correction that has been demonstrated to overcome any loss of throughput due to bit errors that can result from the higher transmission baud rates.

The Model 3306-02 is programmed using HSE's Insight Software (as is the 3306). When Insight is opened, there is a box to check on the opening page if the transmitter being programmed as an ALERT2 unit. By checking this box, additional programming options such as TDMA Timing features become available.

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WHERE THE PAST AND PRESENT MEET
Ugrading the Papillion Creek Watershed Flood Warning System

The Papio-Missouri River Natural Resources District is one of twenty-three NRD's in the state of Nebraska responsible for the conservation and development of water, soil, forest, and rangeland natural resources. It was created by the state legislature in 1972 and is bordered on the east by the Missouri River and on the south and west by the Platte and Elkhorn Rivers. It also includes the entire Papillion Creek watershed, one of the most flash flood-prone areas in the State of Nebraska.

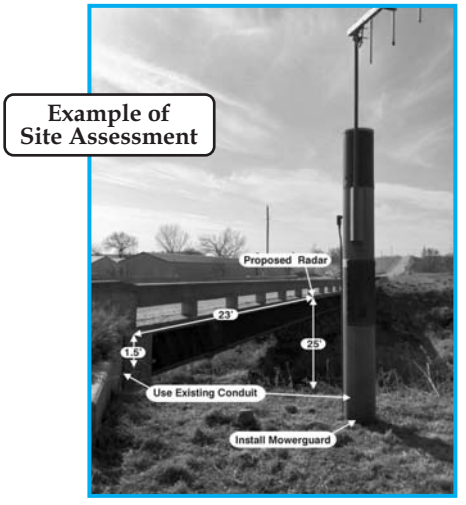
The Past

In 1994 the U.S. Army Corps of Engineers - Omaha District, awarded a contract to HSE to supply and install a 22-site flood warning system in the Pappillion Creek Watershed near Omaha. This was one of HSE's first ALERT "legacy" systems and included the newly launched 3206 Data Transmitter and other relevant state-of-the-art sensors. Regular maintenance was provided by Ron Larson of Aqua Tracker and over the years various components of the system were either repaired or replaced as budget permitted.

The Transition Period

After eighteen years of extreme field conditions, the system was functioning and providing data, but in need of serious attention. Antennas showed stress and fractures due to high wind, pressure transducers were subject to failure due to freezing water, sedimentation impaction and destruction from high flows; and the integrity of some standpipes had been comprised after being hit by mowers.

The NRD reached out to HSE in the Fall of 2010 to discuss a full site assessment and how best to proceed with upgrading their system. Bob Eitel, HSE Services Manager spent a full week in the Omaha area the following April. Together with Amanda Grint and Dick Sklenan of the Water Resources Department, they inspected each site and meticulously reviewed the equipment's condition. Their observations ranged from obvious problems like significant erosion and siltation of creek banks affecting PT's to less noticeable problems like standpipes leaking or mast bolts subject to permanent seizure.



The Present

Starting in December 2011, HSE provided the NRD with new 3306 ALERT Data Transmitters (with data logging and programming capability). Additional shipments in early 2012 included a series of new standpipes, antennas, and fourteen radar sensors for monitoring water level.

As soon as the weather permitted, HSE field technicians went to work at each of the twenty-two sites. Seven sites were retrofitted with HSE's unique standpipe sleeve and most were outfitted with new water level sensors (whether bridge mount radar sensor or traditional PT's). High gain directional antennas were also installed at strategic monitoring sites to ensure a good radio path back to the base station. The NRD additionally had new narrow-band radio transceivers installed in the Repeater and in the NWS base station receiver as part of the upgrade program.

Summary

As a "legacy" system, the Papio-Missouri NRD is an excellent example of the value and integrity of ALERT flood warning stations. It's easy to forget (or take for granted) all that these pioneer systems embody. They accurately and reliably monitor conditions in real time. They are the basis for collecting historical data and forecast modeling. They encourage and facilitate federal, state, and local agencies to interact and work together for the protection of lives and property. And, they are the foundation for new technologies such as ALERT2.

STRATEGIES FOR MONITORING ROAD SURFACE CONDITIONS

At HSE we understand that today's traffic engineers and public works managers are looking for ways to optimize their available resources and find road weather solutions that protect their citizen's investments in the most cost-effective way. In particular agencies are seeking reliable strategies for measuring road surface conditions -- everything from surface and sub-surface temperature to reduction of surface grip due to water, snow and ice.

Several product offerings are available from HSE depending on the application and data requirement. Here's a quick recap:

Model 5721-01 Passive Road Surface Sensor

Designed as a low cost, in-road surface sensor, the 5721-01 easily integrates with other field devices in an ITS network or in an ALERT Systems network. The sensor monitors the actual road surface environment and is well suited for roadways, ice-prone bridges, and elevated roadways, entryways, parking garage ramps, and loading docks. Average cost: Under $1K USD.

Model 5721-05 RWIS Road Sensor Station

The 5721-05 is an in-road NTCIP 1204 (limited) Environmental Sensor Station. The station samples conditions at both the surface and sub-surface and determines the roadway state (dry, wet or Icewatch) by observing temperature and moisture phase changes. Average cost: Under $2.5K USD.

Model 5433 IceSight Remote Road Surface Condition Sensor

Mounted easily on nearby traffic, luminary, camera poles or on RWIS towers, this rugged all-weather sensor provides an economical means of gathering road condition information. It is a non-intrusive surface condition sensor that uses laser and infrared electro-optical technology to read surface condition, temperature, and surface grip. The IceSight's Ethernet port allows it to communicate directly with a Central Station via a variety of standard Ethernet communication devices and it's non-proprietary protocol. Average cost: Under $12K USD.

For more information on any of these products, please call your nearest HSE Authorized RWIS Reseller or visit our web site at www.highsierraelectronics.com.

ADVICE FROM THE FIELD

Jerry Bloom, Technician
High Sierra Electronics, Inc.
Tip: Siting Wind Speed & Direction Sensors

The quality of wind sensors can be comprised by poor exposure to local topography. Placement of the wind sensors should follow standards by agencies such as the World Meteorological Organization (WMO) and the National Weather Service (NWS).

According to the WMO, the standard exposure of wind instruments over level, open terrain is 33 feet (10 meters) above the ground. Open terrain means the distance between the wind sensors and the nearest obstruction is at least ten times the height of that obstruction.

For roof mounted sensors, the exposure should be at a height of at least 1.5 times the height of the building. For extremely tall buildings this rule can be difficult to follow. For tall buildings, the sensors should be at least 33 feet (10 meters) above the roof or above the tallest obstruction on the roof. Whenever possible, the sensors should be placed on the upwind side of the building. Ventilation and exhaust vents must be avoided.

For ground mounted sensors near a building, the upwind side of the building is preferred with the sensors located at a distance that is at least one times the height of the building. The downwind side of the building requires that the sensors be located at a distance of five to ten times the height of the building. When wind sensors are located too close to a building, "wind milling" of the direction vane will occur and the speed sensor will measure artificial gusts.

If wind sensors must be located among vegetation, pick a spot that is almost equidistant from the tallest trees or shrubs. A clearing with a diameter at least ten times the height of the tallest tree or shrub is ideal. Even with the best possible location, it's sometimes necessary to add some height to the sensor mast in order to get better exposure.

CHECK IT OUT! HydroMet Data Logger

HSE is pleased to announce the Model 3512 HydroMet Data Logger . . . A powerful and flexible addition to our family of products designed with the field technician in mind.

The 3512 is typically installed in a gage house or NEMA-4 enclosure to protect it from the elements. Connections are made using plug-in terminal strips that allow quick disconnect for easy installation or replacement. It will accept up to 8 analog (plus internal battery), up to 2 shaft encoders, up to 2 precipitation, SDI-12, wind speed, wind direction and peak gust.

For more information, please call 800-275-2080 and ask for the Sales Department.

What Happened?

In June 1954, a dying hurricane stalled over the Pecos River basin. The flash-flood surge on the Pecos along Hwy 90 reached up to 86' in height, destroying the road and the highway bridge.

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HSE Anniversary
1992-2012

SAVE THE DATE

Make plans now to attend the American Public Works Association Congress & Exposition, August 26-29 at the Anaheim Convention Center, CA. www.apwa.net/congress.

Stop by HSE's exhibit booth, #854 for a demonstration of our Advance Warning System for monitoring flooding on low points on the roadway.

Make plans to also to visit HSE at the ASDSO Conference in Denver, CO. September 16 - 20, Booth #33

For an additional listing of events, go to HSE's web site and click on News & Events.

The Sierra Summit is published by High Sierra Electronics for companies, agencies, and individuals devoted to environmental monitoring. It is distributed without charge on a quarterly basis.

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ADDRESS CORRECTION REQUESTED

WHAT IS SDI-12?

SDI-12 stands for serial data interface at 1200 baud. It is a standard communications protocol which provides a means to transfer measurements taken by an intelligent sensor to a data transmitter or recorder.

Why use micro-processed based sensors? A micro-processor in the sensor may calibrate the sensor, control it's measurements, and convert raw sensor readings into engineering units. The micro-processor also controls the SDI-12 interface. It accepts and decodes instructions received from the data recorder, starts the measurements, controls all timing, and uses the SDI-12 protocol to communicate with the data transmitter or recorder.

HSE offers several SDI-12 products including the Model 3306 Data Transmitter with a SDI-12 input, our new Model 6600-20 SDI-12 PT Signal Conditioning Device, the Model 4015 SDI-12 to Analog Output Converter, and the Model 4046 SDI-12 Sensor Interface. Future developments include a SDI-12 Water Temperature Sensor.

Model 4046
Sensor to SDI Interface

SIERRA SUMMIT CHALLENGE

Test your skill and knowledge of these random weather facts:

1. The winter of 1932 in the US was so cold that Niagara Falls froze completely soild.
A) True
B) False

2. It snows more in the Grand Canyon than it does in Minneapolis, MN.
A) True
B) False

3. In ten minutes, a hurricane releases more energy than all the world's nuclear weapons combined.
A) True
B) False

4. Scientists calculate that the Earth sees about 760 thunderstorms very hour.
A) True
B) False

5. -40 degrees Celsius is equal to -40 degrees Fahrenheit.
A) True
B) False

1 thru 5 True