

Thief hatches are one of the largest source of methane leaks on a well site. Recent surveys indicate that thief hatches are too often left accidentally open. For average tank batteries, a cumulative thief hatch leak duration of 100 hours or more will vent VOCs in excess of 6 tons per year, which is the limitation set by NSPS 0000/0000a, leading to the shutdown of oil production for the remainder of the year, or the operators will have to pay hefty fines.

With NOVENT™ Cimarron has developed a plug and play solution made of individual inclinometers, completely wireless and battery operated, that communicate each thief hatch status in near real time to the cloud. That information is then made available events through a dashboard displaying alerts as well as cumulative thief hatch events for a tank battery.

In addition, Cimarron can provide the full PERFORMANCE MONITORING of the thief hatches and have fast response service crews address these alert and minimize the time thief hatches are left open. When on site, the service crews can troubleshoot the reasons why thief hatches will pop open randomly, identify plumping issues or liquid traps causing pressure drops, and remediate the problem.



BENEFITS

Base Station:

- One Cloud & SIM subscription for up to 32 data points
- Solar Powered with 14 days autonomy
- User friendly, ready to mount and use, form factor
- Cost effective connectivity of a SignalFire's 900 MHz network to the Cloud
- Send measurements with 900 MHz closer to where there is cellular coverage
- LTE M / NB-IoT ready for broader coverage
- Cloud ready and connectivity with other hosts compatible with MQTT / SparkPlugB

Wireless Tilt Sensor:

- 3 Axis Accelerometer constantly monitors angle and reports status. Will report on state change.
- Hazardous Location Certified – Class 1 Division 1
- Rugged design for outdoor environments
- Magnetic mounting or with built-in installation holes
- Pushbutton zeroing
- Long battery life (greater than 5 years)
- Up to ½ mile range
- Built-in 900MHz radio and antenna
- Operates as a standard wireless node in the SignalFire network

Wireless Tilt Sensor
Installed on hatch



BASE STATION TECHNICAL SPECIFICATION

Environmental:

- Operating Temperature: -40°F to 185°F (-40°C to 85°C)
- Humidity: 0 - 95% non-condensing
- Power:
 - Solar Powered (integrated 10W panel)
 - Built-in rechargeable battery & charge controller
 - 14 days of autonomy with no sun

Enclosure Specs & Mounting:

- NEMA 4X / IP66, Polycarbonate UV Rated
- 9.8" (240mm) wide x 14.1" (357mm) tall x 7.0" (178mm) deep
- 15.3 lbs (6.9 kg)
- 2" U-Bolt mount included
- Antenna (included)
 - Panel mounted omni-directional LTE
 - Panel mounted omni-directional 900 MHz

900 MHz Specifications:

- Integrated SignalFire DIN Gateway V2 (see SignalFire DIN Gateway V2 for complete specifications)
- Radio Power/Range: 500 mW (approx. 3 miles line of sight [5 km])
- Antenna Type: Omnidirectional. +2dB

- gain, -105dB receive sensitivity
- Frequency: 902-928 MHz license-free ISM band compliant with FCC Part 15 and Industry Canada
- Wireless 900 MHz End Nodes: 32 max-imum. Depends on number or registers being used for each node
- Internal Diagnostics: Line voltage, signal strength, error conditions event logging, Modbus communications
- Inputs & Outputs:
 - Two (2) digital inputs
 - Two (2) digital outputs (open collector pull down)
 - Three (3) 1-5Vdc / 4-20mA analog inputs

Cellular Specifications:

- Input/Output integrated with RANGER electronics:
 - 1 Latching Relay Output (2A @ 30Vdc; 0.3A @ 110Vac; 0.5A @ 125Vac). Failsafe & local automation configurable
 - 2 Digital Inputs report state, total counts, frequency (2kHz max), volume total with K Factor
 - Analog Input (1-5Vdc or 4-20mA). Configurable for flow totalizing mode.

- Data Interface: LTE CAT M1 / NB-IoT, auto-selectable
- SparkPlug B messaging
- Cellular Radio Power: 23dBm
- Electrical Connection: Pluggable terminal block, 16-30AWG screw terminals
- Local Micro-USB Configuration Port
- Estimated Monthly Data Usage: » Check-in interval dependent » 1 min = 27 MB » 5 min = 5.4 MB » 15 min = 1.08 MB » 60 min = 0.27 MB
- LTE band support: Cat-M1 / NB-IoT: B1, B2, B3, B4, B5, B8, B12, B13, B14, B17, B20, B25, B26, B28, B66
- Supports 4FF SIM type
- Power saving features:
 - eDRX
- Secure socket using TLS
- PTCRB Certified

TILT SCOUT TECHNICAL SPECIFICATION

Operating Temp:

-40 to +176°F (-40°C to 80°C) Humidity: NEMA 4X Enclosure Resolution: <0.1 degree
 Power: Internal battery pack. Field replaceable
 Battery Life: Greater than 5 years
 Data Interface: Wireless - available as Modbus registers at Gateway Reporting: Will report every 10 minutes or immediately after a state change.

Radio Specifications:

- Power: 40 mW
 - Receive Sensitivity: -109 dB
 - Encryption: AES 128 bit
 - Frequency: 902-928 MHz, FHSS, license-free
- ISM Band Compliant with FCC Part 15 Range: Up to 1/2 mile
 Intrinsically Safe: Hazardous Location Certified - Class 1
 Division 1 is Temp Code T3, Groups C&D. Conforms to UL Std. 913, Certified to Can/CSA Std C22.2 No. 157
 Internal Diagnostics: Battery voltage, signal strength, error conditions