H2scan
ADVANCED HYDROGEN SENSING

Sentinel™ PRO

IoT MONITOR

Gain Grid Intelligence and Multi-Parameter Visibility with Sentinel PRO

H2scan's Sentinel™ PRO delivers best-in-class grid intelligence for transformer monitoring and protection. As part of a comprehensive package with H2scan's H2cloud platform, Sentinel PRO delivers state-of-the-art system visibility and data analytics toolkits to support a fleet-wide view of transformer health. It supports the modernization and protection of low-voltage distribution systems, including renewable energy platforms, long lines and large loads.

Other distribution transformer monitoring platforms cannot diagnose gassing, a critical factor for preventing catastrophic failures. Sentinel PRO presents asset managers with a low-cost IoT-enabled hydrogen DGA (dissolved gas analysis) measurement for transformer protection. This platform is proven at scale in nationwide deployments across distribution system operator fleets.

Interfacing directly with GRIDSCAN® 5000 and 6000 series transformer monitors, Sentinel PRO combines granular power quality data like voltage, current and harmonic distortion with additional information like hydrogen, moisture and pressure. This data set allows utility asset managers to determine the root cause of an issue, take corrective actions and mitigate potential equipment and collateral damage.

An IEC 61000-4-30 Class A certified device, Sentinel PRO provides highly accurate data capture, even in significantly regulated "stiff" grid conditions, for predictive maintenance and fault avoidance. While standard power quality monitoring has limited value in stiff grids, Sentinel PRO identifies issues from problem areas, variable renewable output, long feeders, switching loads, and more.

Asset managers gain industry-leading monitoring and asset health visibility at a price point unmatched by market alternatives, with centralized reporting and dashboard. By reducing OPEX and improving asset resilience and life cycles through data-driven management, Sentinel PRO, paired with H2scan's GRIDSCAN 5000 or 6000 hydrogen sensor, provides transformative fleet-monitoring capabilities for unmatched reliability to maintain optimal grid performance.

- Industry-leading and advanced power quality capabilities combining fault detection and transformer health data
- Integration of online dissolved gas analysis, moisture, pressure, etc., into transformer health monitoring
- Wide range of applications to identify power quality issues for renewable energy platforms, long lines or large loads
- Centralized visibility across the entire network via cloud

Power Intelligence for a Transitioning Grid

Stiffness Assessment: Monitor regulation and stability

Disturbance Analysis: Identify issues from variable generation or other disturbances

Integrated Intelligence: Transformer monitoring plus power quality

Centralized Visibility: Consolidated data across the Distribution network

Grid Readiness: Ensure power quality during energy transition

Multiple Connectors: Collect data from multiple sensors for current, voltage, harmonics and more

Rapid Deployment: Plug-and-play installation in less than 30 minutes

Utility-Trusted: H2scan sets the industry's "gold standard" for hydrogen sensing solutions

27215 Turnberry Lane, Unit A, Valencia, CA 91355, USA | +1 661-775-9575 | sales@h2scan.com | www.h2scan.com

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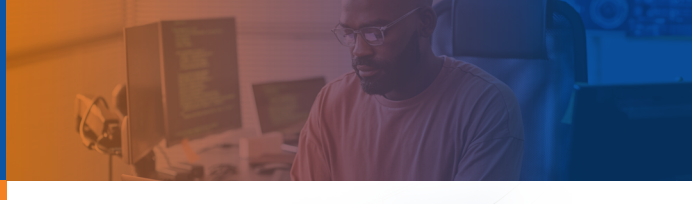

For utilities facing transformer failures from harmonics, lack of visibility, overloading, etc., Sentinel PRO delivers the multi-parameter intelligence utilities need. Manage power quality and transformer health with predictive, real-time data delivered seamlessly to optimize operations with a complete, integrated solution.

Specifications

Product Details	
Dimensions	240 mm x 134 mm x 55 mm
Communications	Global availability on cellular: 3G, 4G, LTE, NB-IoT Optional - Modbus RTU/TCP, "Last Gasp" alert in case of interruption, internal secure storage 60+ days data
IP Rating	IP 67, for both indoor and outdoor applications
Installation	Neodymium magnetic attachment, wall/pole mount bracket, Din-rail

Voltage Measurement	
Nominal Voltage	240 VAC @ 50 Hz/110 110 VAC @ 60 Hz
Operating Limits	87 VAC to 264 VAC: 50 Hz/ 99 VAC to 121 VAC @ 60 Hz
Device Burden	10 VA (without accessories) 30 VA (with accessories)
External PSU	Not required
Nominal Voltage	U1, U2, U3, UNE/4
Measurement Range Limits	0 VA to 400 VAC
Voltage Connections	Ground mount: G clamp, voltage test lead, fused carrier, etc., pole mount: fused insulation piercing clamp (IPC)

Current Measurement	
DGA Compatibility	H2scan GRIDSCAN 5000 or 6000
Phases	3P + N
Current Ranges	100 A, 600 A, 3000 A, 6000 A
Input Ratio	22.5 mV/kA
Accuracy	Class 0.5
Safety Category	1000 V CATIII, 600 V CATIV
Product Standards	CE, IP66, RoHS 2.0

Power Quality Functions	
Power quality measurements comply with EN 61000-4-30 Class S	
Voltage Measurements	Frequency (10 second average), Flicker (Pst and Pit), Supply voltage dips and swells, Voltage interruption, Supply voltage unbalance, Voltage harmonics (50th), Voltage inter-harmonics, Rapid voltage change, voltage phase angle, VRMS (1 cycle), VRMS (10/12 cycle), voltage waveform buffer with a sample rate of 5120 Hz
Current Measurements	Neutral current can be directly measured, Current harmonics (40th), Current inter-harmonics, Current unbalance, Current phase angle, IRMS (1 cycle), IRMS (10/12 cycle), Current waveform buffer with a sample rate of 5120 Hz
Total Voltage Harmonic Distortion, Total Current Harmonic Distortion, Voltage Under and Over Deviation, Current Under and Over Deviation	

Additional Monitoring	
Voltage Supervision	Supply interruption (<80%), Low voltage (<94%), High voltage (>110%)
Current Supervision	Undercurrent (<1% rated current) Overcurrent (>100% rated current)
Fault Detection	Fault detected on feeder, Earth fault detected, Fuse failure detected, Phase sequence error, Pre-fault sensing waveform recording at 6 kHz / 32 kHz / 64 kHz
Transformer Health Monitoring	Low cost IoT enabled Hydrogen Dissolved Gas Analysis (DGA) for scalable Transformer protection and fault avoidance Transformer health and asset maintenance management via IoT sensing of tank pressure, oil temperature, oil level and manufacturer approved modeling Ambient transformer surface temperature and weather API for advanced transformer load and reinforcement modeling IoT sensing for asset re-rating through manufacturer approved re-rating and asset protection models

Standards
ENA TS 48-5, EN 55011, EN 60529, EN 61000, EN 61010, 2014/30/EU, 2014/35/EU, 2014/53/EU

Specifications subject to change without notice
Printed Documents are uncontrolled.

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