

## FOR NITRIDING & NITROCARBURIZING

The H<sub>2</sub>Smart™ is an integrated sampling system designed to measure hydrogen content with high accuracy in nitriding and nitrocarburizing atmospheres and to calculate the parameters necessary for process control. Its unique measuring cell design and advanced electronics eliminate the need for a reference gas cell, thus simplifying the installation and usage. Moreover, the measuring cell is maintained at a set temperature to protect the system from condensation and contamination during nitrocarburizing and post oxidation processes. An integrated sampling pump with variable output insures reliable flow through the measuring cell. The sampling flow is continuously measured via an integrated mass flow meter, and, if necessary, the flow is adjusted by changing the pump output. In this manner, the closed-loop flow control assures reliable H<sub>2</sub> measurement and thus accurate nitriding and nitrocarburizing control.



H<sub>2</sub>Smart™ is available in 3 options: Base for % H<sub>2</sub> measurement, LT includes Base capabilities plus simplified K<sub>N</sub> calculation, and the premium version PRO includes LT capabilities plus extended calculation of pH<sub>2</sub>, pNH<sub>3</sub>, pO<sub>2</sub>, pCO, pCO<sub>2</sub>, K<sub>N</sub>, K<sub>C</sub>, K<sub>O</sub> and % dissociation. The Base and LT options are field upgradable.

## ADVANTAGES

- High accuracy and repeatability
- Retrofittable on existing equipment or new installations
- Built-in communication devices interface with process supervisory and automation systems
- Built-in Ethernet connections
- Remote Diagnostics/Troubleshooting possible
- Active closed-loop sampling flow control with warning and alarm
- System status displayed on a large, easy to read LCD display



\*optional

## FEATURES

- Built-in electronic control for reading and calculating atmosphere parameters
- Built-in variable output sampling pump
- Digital signal processing
- Polynomial linearization
- Digital display (%H<sub>2</sub> or dissociation, sampling flow)
- Two analog outputs (%H<sub>2</sub> and sampling flow value)
- One analog input (Sampling line temperature sensor)
- Two digital inputs (Enable sampling; Spare – programmable)
- Four digital outputs (Sampling flow alarm; Sampling pump saturation warning; PWM signal for sampling line temperature control; reserved)
- Standard communication: Modbus TCP I/P
- Optional communication: Profibus, Modbus RTU, CAN Bus
- Integrated Web Server Diagnostics/Troubleshooting software for Windows® via Ethernet or serial interface
- Optional dual input card required for AMS 2759/12 compliance:
  - high impedance input for oxygen probe signal (mV)
  - oxygen probe thermocouple input

## SPECIFICATIONS

Power requirements: 2.5 Amps max. @ 24 VDC  
 Outputs: 2 x analog, sourcing, individually isolated, 4 -20 mA (R<500 Ohm)  
 4 x digital OUT, 24 VDC, 0.7 A max.  
 Inputs: 1 x analog, dedicated temperature sensor (optional)  
 2 x digital, 24 VDC  
 Weight: 8.8 lb / 4 kg  
 Dimensions: 7.5" H x 6.7" W x 5.5" D  
 190 H mm x 170 mm W x 140 mm D

### Performance

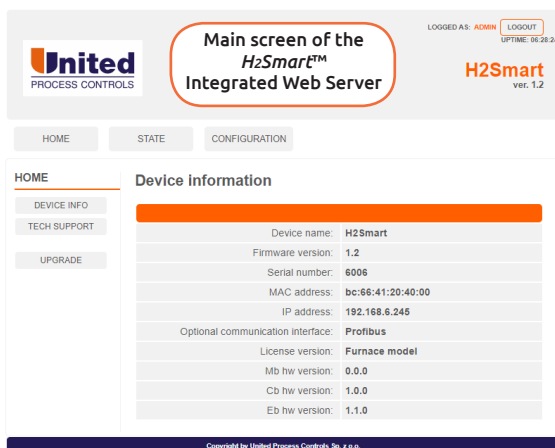
Accuracy: +/- 0.5% of reading plus +/- 0.3% of full scale  
 Linearity: < 0.5% of full scale  
 Repeatability: < 0.5% of full scale  
 Zero drift: < 0.5% of full scale per month  
 Sampling flow: 0.5 lpm / (1 cfh) controlled  
 Response time: 95% in 30 sec @ 0.5 lpm / (1 cfh)

### Factory Calibration

H<sub>2</sub>Smart™ comes factory calibrated and is ready to use out of the box. To prolong its performance and ensure continued measurement accuracy, we recommend an annual factory calibration complete with certificate.

## INTEGRATED WEB SERVER

H<sub>2</sub>Smart™ Integrated Web Server is an integral software component of the H<sub>2</sub>Smart™ used to connect, monitor, and modify the internal configuration of the unit including sensor values, pump flow, communication parameters, flow inputs, atmosphere flow inputs and much more.



FEATURES	OPTIONS		
	Base	LT	PRO
% H <sub>2</sub> Measurement	●	●	●
Simplified K <sub>N</sub> Calculation*		●	●
Full K <sub>N</sub> , K <sub>C</sub> , K <sub>O</sub> Calculation**			●
Modbus TCP/IP	●	●	●
Profibus, Modbus RTU or CAN Bus	□	□	□
O <sub>2</sub> Probe (FNC option)	□	□	□
Plate Assembly	□	□	□
Chart Recorder	□	□	□

● Standard □ Optional

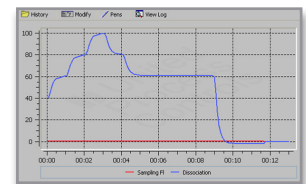
\* Simplified K<sub>N</sub> Calculation - for NH<sub>3</sub> and dNH<sub>3</sub> atmospheres only

\*\* Full K<sub>N</sub>, K<sub>C</sub>, or K<sub>O</sub> Calculation - for NH<sub>3</sub>, dNH<sub>3</sub>, CO, CO<sub>2</sub>, N<sub>2</sub> and H<sub>2</sub>O atmospheres

## Other Options

### Chart Recorder

The chart recorder is an easy to use program set up to the customer's application and lets the user monitor and record real-time readings of process parameters over an Ethernet network. It logs data in standard formats for use in a spreadsheet or SCADA.



### Plate Assembly

The H<sub>2</sub>Smart™, electrical junction box, and filter are provided pre-wired and pre-assembled on a high-grade steel mounting plate, ensuring fast and reliable installation to a wall or panel.



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