H2Smart™

Intelligent Hydrogen Sampling System for Nitriding & Nitrocarburizing

H2Smart
Intelligent Hydrogen
Sampling System

38.2% H2

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PROCESS CONTROLS

S/N HS 05429   www.group-upc.com   CE
TYPE NMR

AMS 2759/10 & 2759/12* Compliant

*optional

The **H2Smart™** 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_2 measurement and thus accurate nitriding and nitrocarburizing control.

> **!**
>
> **H2Smart** is available in 3 models: Base for % H_2 measurement, LT includes Base capabilities plus simplified K_N calculation, and the premium version PRO includes LT capabilities plus extended calculation of pH_2, pNH_3, pO_2, pCO, pCO_2, K_N, K_C, K_O and dissociation.

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 CANopen and 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 alphanumerical display.

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_2 or dissociation, sampling flow)
- Two analog outputs (%H_2 and sampling flow value)
- One analog input (Sampling line temperature sensor)
- Two digital inputs (Enable sampling; Spare – programmable)
- Three digital outputs (Sampling flow alarm; Sampling pump saturation warning; PWM signal for sampling line temperature control)
- Standard communication: CANopen
- Optional communication: Profibus, Modbus RTU
- *H2Smart Studio*^{TM} 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

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AFFILIATED MEMBERS

Furnace Control Corp. | Marathon Monitors Inc. | Process-Electronic | Waukee Engineering Co.

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SPECIFICATIONS

Power requirements: 2.5 Amps max.@ 24 VDC
Outputs: 2 x analog, isolated with common positive
                    rail
                    4 -20 mA (R<500 Ohm)
                    1 x digital, PWM output 24 VDC
                    2 x digital, 24 VDC, 1.5 A max.
Inputs: 1 x analog, temperature sensor
                    2 x digital, 24 VDC
Dimensions: 8.8 lb / 4 kg
Weight: 7.9" H x 8.1" W x 7.6" D
                    2.01 H mm x 205 mm W x 193 mm D

Performance

Accuracy: +/- 0.5% of reading +/- 0.2% 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
Response time: 95% in 30 sec @ 0.5 lpm / 1 cfh

Factory Calibration

H2Smart 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.

H2Smart Studio Software

H2Smart Studio is an integral software component of the *H2Smart* 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.
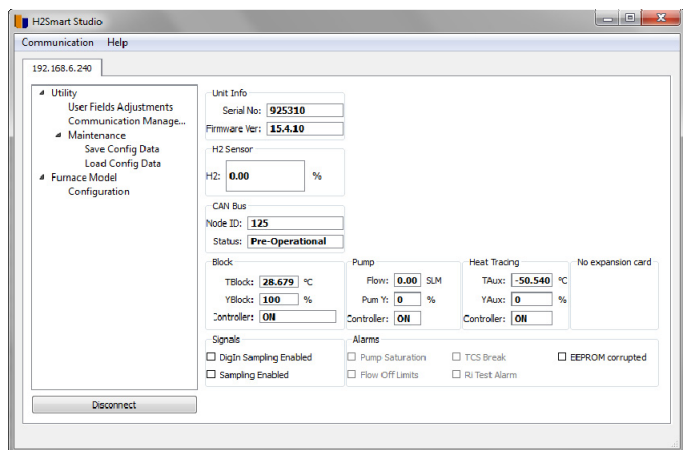
Main screen of the *H2Smart Studio provided* for the PRO model

| FEATURES	H₂Smart Models		
	Base	**LT**	**PRO**
% H₂ Measurement	●	●	●
Simplified K_N Calculation*		●	●
Full K_N Calculation**			●
Full K_C Calculation**			●
Full K_O Calculation**			●
CANopen	●	●	●
Profibus or Modbus	☐	☐	☐
O₂ Probe (FNC option)	☐	☐	☐
Plate Assembly	☐	☐	☐
Chart Recorder	☐	☐	☐

●   Standard   ☐   Optional

*   Simplified K_N Calculation - for NH_3 and dNH_3 atmospheres only
** Full K_N, K_C, or K_O Calculation - for NH_3, dNH_3, CO, CO_2, N_2 and H_2O 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.
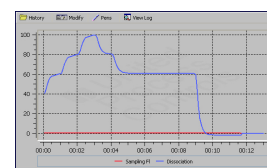
Plate Assembly

The *H2Smart*, 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.