

# H2SMART™

## Modbus RTU Interface Via RS-485

Version 6



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## 1. General

*H2Smart*<sup>™</sup> supports the standard Modbus commands 3 (Read n registers), 6 (write one register), 7 (fast read of sampling enable status). Floating point values are converted to and from 16 bit integers for Modbus communication, providing a LSB value given in the register assignment below. For example, if the *H2Smart*<sup>™</sup> is calibrated for dissociation, a value of 5000 read from Modbus register 0 means a measured dissociation of 50.00%.

Any standard Modbus master with freely settable data addresses should be able to communicate with *H2Smart*<sup>™</sup> without any problems. The interface must be configured for 4 wire communication. (Future development is planned for 2 wire communication.) The connection is through the female DB9 connector on the front of the unit designated 'Opt. Interface'

### **DB9 RS485 pin assignment**

1 - A (TX-)	(four wire mode only)	(WHT)
2 + B (TX+)	(four wire mode only)	(BLK)
3 +B (RX/TX+)		(BLK)
5 GND	(Must be connected)	(GND)
8 - A (RX/TX-)		(RED)

(note: 2 wire not currently supported)

according to the table. The default Modbus slave address of the unit is 2. The *H2Smart*<sup>™</sup> is shipped with default parameters of 9600Bd, 8 bits/character, parity even, 1 stop bit. Setup of Modbus device address and interface mode is done using the *H2Smart*<sup>™</sup> service software.

## 2. Modbus Register Assignment

### 2.1 Read Only Registers

- 0** *H2Smart*<sup>™</sup> sensor result (H<sub>2</sub> or Dissociation, depending on calibration type) in 0.01%
- 1** Flow rate in 0.001 SLM or CFH (depending on flow sensor unit configuration)
- 3** TBlock in 0.01°C or °F (depending on temperature unit configuration)
- 4** Taux in 0.01°C or °F (depending on temperature unit configuration)
- 5** State of the digital inputs
- 6** State of the digital outputs
- 28** Model calculated KN in units of 0.01
- 29** Model calculated aC in units of 0.001
- 37** O<sub>2</sub> probe voltage measured by the optional O<sub>2</sub> probe input module in 0.1mV
- 38** O<sub>2</sub> probe temperature of the O<sub>2</sub> input module in 0.1 °C or ° F (depending on temperature unit configuration)
- 48** Model calculated KC in units of 0.01

## 2.2 Read/Write Registers

- 9** Modbus sampling enable override signal: 0: Sampling stopped, 1: Sampling enabled  
**For continuous sampling, the sampling enable signal must be sent regularly every 10 to 80 seconds.** If the sampling enable signal is not received, the sampling will stop after 90 seconds. This is to ensure that the unit does not get damaged in the event of a loss of communication.
- 10** Process gas 1 (Nitrogen) flow value in 0.001 m<sup>3</sup>/h (must be updated for a correct KN calculation)
- 11** Process gas 2 (Ammonia) flow value in 0.001 m<sup>3</sup>/h (must be updated for a correct KN calculation)
- 12** Process gas 3 (Dissociated Ammonia) flow value in 0.001 m<sup>3</sup>/h (must be updated for a correct KN calculation)
- 13** Process gas 4 (Carbon Dioxide) flow value in 0.001 m<sup>3</sup>/h (must be updated for a correct KN calculation)
- 14** Process gas 4 (Carbon Monoxide) flow value in 0.001 m<sup>3</sup>/h (must be updated for a correct KN calculation)
- 18** Furnace model Initialize. Writing 1 to this value resets the furnace model to the start condition.
- 30** Furnace temperature in 0.01°C

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