

H₂SMART™

Modbus RTU Interface Via RS-485

Version 6



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1. General

*H2Smart*TM 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*TM 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*TM 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*TM 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*TM service software.

2. Modbus Register Assignment

2.1 Read Only Registers

- | | |
|-----------|--|
| 0 | <i>H2Smart</i> TM sensor result (H ₂ 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 ₂ probe voltage measured by the optional O2 probe input module in 0.1mV |
| 38 | O ₂ probe temperature of the O2 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 m3/h (must be updated for a correct KN calculation)
- 11** Process gas 2 (Ammonia) flow value in 0.001 m3/h (must be updated for a correct KN calculation)
- 12** Process gas 3 (Dissociated Ammonia) flow value in 0.001 m3/h (must be updated for a correct KN calculation)
- 13** Process gas 4 (Carbon Dioxide) flow value in 0.001 m3/h (must be updated for a correct KN calculation)
- 14** Process gas 4 (Carbon Monoxide) flow value in 0.001 m3/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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