

Digital Environmental Sensor Modbus Module

Compact Modbus RTU environmental sensor interface for DS18B20 1-Wire temperature and SHT40 I2C temperature/humidity sensors.

Digital Environmental Sensor Modbus Module

Compact Modbus RTU interface module designed for digital temperature and humidity monitoring using DS18B20 and SHT40 digital sensors.



Key Features

- Multi-sensor support: Up to 4x DS18B20 digital temperature sensors or 1x SHT40 high-precision humidity & temperature sensor
- Standard Modbus RTU protocol interface over 2-wire RS-485
- Front rotary/DIP address selection switch (Addresses 1 to 15)
- Wide configurable baud rate support from 300 bps to 115200 bps
- Sensor health & open-circuit fault diagnostics with error status registers
- Dual value reporting: Scaled 16-bit integers and IEEE-754 32-bit floating point values
- Dual power input: 12~24V DC industrial field power or 5V DC USB power
- Compact 35 mm DIN rail mounting enclosure (60 mm x 50 mm x 20 mm)

ModViz – Modbus Configuration & Visualization Tool

ModViz is a powerful yet simple configuration and visualization tool designed to work seamlessly with **Veawe Modbus I/O modules**. It enables engineers, system integrators, and technicians to quickly configure, monitor, and test field devices through an intuitive graphical interface.

The software can be downloaded from <https://veawe.io/modviz/>

Ordering Information

Product Code	Description
MIO-DES1	Digital Environmental Sensor Interface (DS18B20 & SHT40 to Modbus RTU)
MIO-2AI-VI	2-Channel Analog Input Modbus RTU RS485 Module
UC-RS485	Industrial USB to RS-485 Converter
SPD-RS485	RS-485 Communication Line Surge Protection Device
UC-ETH-RS485	Industrial Ethernet to RS-485 Modbus Gateway

Applications

- **Server Rooms & Data Centers:** High-density ambient temperature and humidity tracking for rack monitoring.
- **Cold Storage & Warehousing:** Multi-point temperature logging across refrigerated compartments and perishable storage.
- **HVAC & Building Automation:** Duct and room ambient environmental monitoring integrated with BMS / SCADA.
- **Industrial Process Monitoring:** Enclosure and machine cabinet temperature monitoring for thermal management.

Specifications

Parameter	Value
Mounting Type	35 mm DIN Rail Mounting
Dimensions	60 mm x 50 mm x 20 mm (L x W x H)
Enclosure Material	Industrial ABS plastic
Operating Temperature	−20 °C to +70 °C
Storage Temperature	−40 °C to +85 °C
Relative Humidity	5% to 95% RH (non-condensing)

Electrical Specifications

Parameter	Value
Supply Voltage	12V to 24V DC (Nominal 24V DC) or USB 5V DC
Power Consumption	< 0.5 W @ 24V DC
Communication Interface	RS-485 (2-Wire Half-Duplex)
Baud Rate Range	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps
Data Format	8 Data Bits, 1 Stop Bit, None / Even / Odd Parity

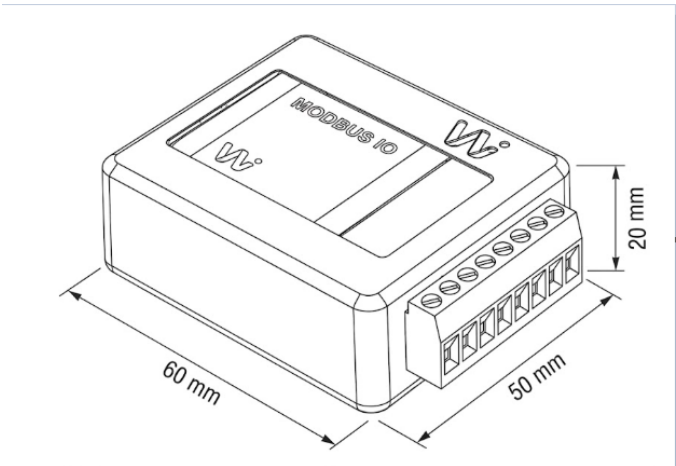
Input/Output Specifications

Parameter	Specification
Supported Sensor Types	Maxim DS18B20 (1-Wire) or Sensirion SHT40 (I2C)
DS18B20 Capacity	Up to 4 independent 1-Wire temperature sensors
DS18B20 Temp Range	-55 °C to +125 °C (Accuracy ±0.5 °C from -10 °C to +85 °C)
SHT40 Temp Range	-40 °C to +125 °C (Accuracy ±0.2 °C)
SHT40 Humidity Range	0% to 100% RH (Accuracy ±1.8% RH)

Isolation & Protection Specifications

Parameter	Value	Notes / Description
Supply Reverse Polarity Protection	Integrated	Series protection diode on DC power inputs
Transient Voltage Clamping	Up to 600W	TVS suppression diodes on power and RS-485 lines
RS-485 Bus ESD Protection	±15 kV	IEC 61000-4-2 Air Discharge / HBM

Mechanical Dimensions



Terminal Details

Pin	1	2	3	4	5	6	7	8
Signal	24V+	24V-	A+	B-	VCC_S	DQ / SDA	SCL	GND_S

Wiring Diagrams

Note: All connection diagrams shown are for illustrative purposes and standard sensor connections.



Communication Interface

Protocol	Physical Layer	Default Baud Rate	Default Format
Modbus RTU	RS-485	19200	8N1

Basic Process Registers

Signal	Address	Type	Description
Temp 1 / SHT40 Temp	30001	int16	Temperature value in 0.1 °C units (e.g. 254 = 25.4 °C)
SHT40 Humidity	30002	int16	Relative humidity in 0.1 %RH units (e.g. 550 = 55.0 %RH)

Supported Modbus Function Codes

Read	Write
02 – Read Discrete Inputs	06 – Write Single Register
04 – Read Input Registers	16 – Write Multiple Registers

Register Map Overview

Function	Address Range	Type	Description
Discrete Inputs	10001–10004	Bit	Sensor 1 to 4 connection / fault status (1 = Fault/Open)
Input Registers	30001–30004	int16	Sensor 1 to 4 Temperature integer values (0.1 °C)
Input Registers	30005	int16	SHT40 Humidity integer value (0.1 %RH)
Input Registers	30011–30018	float32	Sensor 1 to 4 Temperature float values (IEEE-754)
Input Registers	30019–30020	float32	SHT40 Humidity float value (IEEE-754)
Holding Registers	40101	int16	Modbus slave address (1 to 15 from DIP switch)
Holding Registers	40102	int16	Baud rate selection (0=9600, 1=19200, 2=38400, etc.)
Holding Registers	40103	int16	Parity & framing configuration
Holding Registers	40201	int16	Connected sensor configuration (0=DS18B20, 1=SHT40)

Detailed Register Tables

Discrete Inputs (1xxxx)

Address	Description
10001–10004	Sensor 1 to 4 open-circuit / disconnect fault flag

Input Registers (3xxxx)

Address	Type	Description
30001–30004	int16	Sensor 1 to 4 Temperature (scaled by 10)
30005	int16	SHT40 Relative Humidity (scaled by 10)
30011–30018	float32	Sensor 1 to 4 Temperature IEEE-754 float (°C)
30019–30020	float32	SHT40 Relative Humidity IEEE-754 float (%RH)

Holding Registers (4xxxx)

Communication Settings

Address	Type	Description
40101	int16	Slave address (read from front DIP switch)
40102	int16	Baud rate code (Default: 1 = 19200 bps)
40103	int16	Serial parity (0 = 8N1, 1 = 8E1, 2 = 8O1)

Default Settings

Parameter	Default Value
Modbus Address	Defined by DIP switch (Default: 1)
Baud Rate	19200 bps
Parity & Framing	8 Data bits, No Parity, 1 Stop bit (8N1)

Configuration Settings

- **Address Selection:** Set via onboard DIP switch from address 1 to 15.
- **Baud Rate Configuration:** Configurable using ModViz software tool or writing to Holding Register 40102.

LED Indications and Diagnostics

LED	Color	Status	Description
PWR	Red	ON	Power supply 24V DC / USB 5V normal
TX/RX	Green	Blinking	RS-485 Modbus communication active
FAULT	Yellow	ON	Sensor disconnected or wire open circuit

Revision History

Revision	Date	Description of Change
Rev 1.0	2026-09-09	Initial datasheet release for MIO-DES1

Get the latest version of this datasheet : **[click here..](#)**

Support

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