Raritan EMX Modbus Interface

Contents

Introduction

The EMX device can act as a Modbus/TCP server. The Modbus service can be enabled in the Network Services section of the Device Settings menu in the web UI.

Supported Modbus Functions

The following Modbus function codes are supported:

- General Commands:
  - Read Device Identification (0x2b)
- 16-bit Word Access:
  - Read Holding Registers (0x03)
  - Write Single Register (0x06)
  - Write Multiple Registers (0x10)

Feature Set

The following features of the EMX are available via Modbus:

- Peripheral sensor readings
- Peripheral actuator control

Register Layout

Conventions

- All register addresses are hexadecimal, indicated by a 0x prefix.
- Data types which span multiple 16-bit registers are big-endian, i.e. the lowest register address contains the most significant bits.
- The following data types are supported for holding registers:

  - Word: 16-bit unsigned integer
  - DWord: 32-bit unsigned integer (two registers, big-endian)
  - QWord: 64-bit unsigned integer (four registers, big-endian)
  - Float: IEEE 32-bit floating point value (two registers, big-endian)
  - Bit Mask: 16 individual bits

- The access flags column can have the following values:

  - R: Read-only register
  - W: Write-only register (writing triggers an action, always reads 0)
  - R/W: Read-write register

- Reading a reserved register usually yields zero, but the meaning may change in future versions.

Holding Register Map

Start	End	Function
0x0000	0x0010	Basic EMX parameters
. . .		
0x1000	0x100f	Peripheral sensor 1
0x1010	0x101f	Peripheral sensor 2
. . .		
0x1810	0x181f	Peripheral sensor 130

Basic EMX Parameters

Address	Type	Access	Parameter
0x0000	Word	R	Register set version (8 bit major, 8 bit minor)

Peripheral Sensors

- Up to 130 sensors, 16 holding registers each
- Base address (i = 0..129): 0x1000 + i * 0x0010

Offset	Type	Access	Parameter
0x00	Word	R	Sensor type:

- 0: unassigned
- 1: Temperature in degrees Celsius
- 2: Relative humidity in %
- 3: Air flow in m/s
- 4: Air pressure in Pa
- 5: Contact closure (0: off, 1: on)
- 6: Vibration in G
- 7: Water leak (0: normal, 1: alarm)
- 8: Smoke detector (0: normal, 1: alarm)
- 9: Ambient light in lux
- 10: Dry contact (actuator, 0: off, 1: on)
- 11: Magnetic contact (0: off, 1: on)
- 12: Passive IR motion detector (0: off, 1: on)
- 13: Tamper detector (0: normal, 1: alarm)
- 14: Powered dry contact (actuator, 0: off, 1: on)
- 15: Absolute humidity in g/m^3
- 16: Acceleration in G

Offset	Type	Access	Parameter
0x01	Word	R	State (for discrete sensors)
0x02~0x03	Float	R	Sensor reading (for numerical sensors, see above for unit)
0x04	Word	R/W	Actuator control
0x05~0x0f			Reserved