MODBUS RTU REGISTER MAP FOR VACON 100 DRIVES

Register Address (Dec)	Parameter Name	Function Code (Read/Write)	Data Type	Scaling/Unit	Description
Coils (Function 01/05/15)					
0000	RUN/STOP	Read/Write	1-bit	-	Control Word, bit 0. 0=Stop, 1=Run.
0001	Direction	Read/Write	1-bit	-	Control Word, bit 1. 0=Forward, 1=Reverse.
0002	Fault reset	Read/Write	1-bit	-	Control Word, bit 2. Rising edge (0->1) resets faults.
0010	Reset Op Days	Write	1-bit	-	Write 1 to clear the resettable operation day counter.
0011	Reset Energy	Write	1-bit	-	Write 1 to clear the resettable energy counter.
Discrete Inputs (Function 02)					
10000	Ready	Read	1-bit	-	Status Word, bit 0. Drive is ready to run.
10001	Run	Read	1-bit	-	Status Word, bit 1. Motor is running.
10002	Direction	Read	1-bit	-	Status Word, bit 2. 0=Clockwise, 1=Counterclockwise.
10003	Fault	Read	1-bit	-	Status Word, bit 3. Drive has an active fault.
10004	Alarm	Read	1-bit	-	Status Word, bit 4. Drive has an active alarm.
10005	At reference	Read	1-bit	-	Status Word, bit 5. Motor is running at reference speed.
10006	Zero speed	Read	1-bit	-	Status Word, bit 6. Motor is at zero speed.
10007	Flux ready	Read	1-bit	-	Status Word, bit 7. Motor is magnetized.
Input Registers (Function 04)					
Process Data Out (Slave -> Master)					
2101	FB Status Word (Low)	Read	16-bit	-	Low 16 bits of the 32-bit Status Word.
2102	FB General Status Word	Read	16-bit	-	High 16 bits of the 32-bit Status Word.
2103	FB Actual Speed	Read	16-bit	0.01 %	0...10000 (100.00%). Scaled output.

2104	Process Data Out 1	Read	16-bit	Varies	Default: Output Frequency (ID 1), 0.01 Hz
2105	Process Data Out 2	Read	16-bit	Varies	Default: Motor Speed (ID 2), 1 RPM
2106	Process Data Out 3	Read	16-bit	Varies	Default: Motor Current (ID 3 or 45), 0.1 A
2107	Process Data Out 4	Read	16-bit	Varies	Default: Motor Torque (ID 4), 0.1 %
2108	Process Data Out 5	Read	16-bit	Varies	Default: Motor Power (ID 5), 0.1 %
2109	Process Data Out 6	Read	16-bit	Varies	Default: Motor Voltage (ID 6), 0.1 V
2110	Process Data Out 7	Read	16-bit	Varies	Default: DC Link Voltage (ID 7), 1 V
2111	Process Data Out 8	Read	16-bit	Varies	Default: Active Fault Code (ID 37), -
Holding Registers (Function 03/06/16)					
Process Data In (Master -> Slave)					
2001	FB Control Word (Low)	Read/Write	16-bit	-	Low 16 bits of the 32-bit Control Word.
2002	FB General Control Word	Read/Write	16-bit	-	High 16 bits of the 32-bit Control Word.
2003	FB Speed Reference	Read/Write	16-bit	0.01 %	0...10000 (100.00%). Main frequency command.
2004	Process Data In 1	Read/Write	16-bit	Varies	Application-specific control data.
2011	Process Data In 8	Read/Write	16-bit	Varies	Application-specific control data.
Application Parameters (16-bit)					
0001-2000	Application Parameter	Read/Write	16-bit	Parameter-specific	Direct access to parameter by its ID number.
2200-10000	Application Parameter	Read/Write	16-bit	Parameter-specific	Direct access to parameter by its ID number.
ID Map					
10501-10530	IDMap IDs	Read/Write	16-bit	-	Write a parameter ID here to map it.
10601-10630	IDMap Values (16-bit)	Read/Write	16-bit	Parameter-specific	Read/Write the value for the parameter mapped in 10501-10530.
Counters & Faults					
40401-40429	Fault History	Read	16-bit	-	Upper byte: fault code, Lower byte: subcode.

40511-40568	Fault History (16-bit)	Read	16-bit	-	16-bit fault code and 16-bit subcode pairs.

Complete Modbus Fault Registers
Fault History Registers (Function 04 - Input Registers)

Register Address (Dec)	Register Address (Hex)	Name	Data Type	R/W	Description
40401	0x9DE1	Fault History 1	16-bit	R	**Byte Format:** Upper byte = Fault Code, Lower byte = Sub Code. Latest fault is first.
40402	0x9DE2	Fault History 2	16-bit	R	Upper byte = Fault Code, Lower byte = Sub Code.
40403	0x9DE3	Fault History 3	16-bit	R	Upper byte = Fault Code, Lower byte = Sub Code.
...	**...**	**...**	**...**	**...**	**... (Holds 29 faults)**
40429	0x9DFD	Fault History 29	16-bit	R	Upper byte = Fault Code, Lower byte = Sub Code.
40511	0x9E3F	Fault Code 1	16-bit	R	**16-bit fault code** for the latest (most recent) fault.
40512	0x9E40	Sub Code 1	16-bit	R	**16-bit sub code** for the fault in index 1.
40513	0x9E41	Fault Code 2	16-bit	R	16-bit fault code for the second most recent fault.
40514	0x9E42	Sub Code 2	16-bit	R	16-bit sub code for the fault in index 2.
...	**...**	**...**	**...**	**...**	**(Holds 29 faults with full 16-bit codes)**
40567	0x9E87	Fault Code 29	16-bit	R	16-bit fault code for the oldest fault in history.
40568	0x9E88	Sub Code 29	16-bit	R	16-bit sub code for the fault in index 29.

Important Note on Reading Fault History: The manual states that "Reading the fault history items is slow. Reading all 30 items at once might take up to 600 milliseconds." It is better to read only the first few registers (e.g., 40401 or 40511/40512) to check for the most recent active fault.
Prioritized Search for Key Registers

The most efficient and high-performance method to read these values is via the dedicated Process Data registers. These are designed for fast, cyclic communication. The addresses below are for Input Registers (Function Code 04).

Priority	Parameter	Register Address (Dec)	Register Address (Hex)	Data Type	Scaling/Unit	Notes
1	**Output Frequency**	2104	0x0833	16-bit	0.01 Hz	**Process Data Out 1**. Default mapping is Parameter ID 1.
2	**Output Current**	2106	0x0835	16-bit	0.1 A	**Process Data Out 3**. Default mapping is Parameter ID 3.
3	**DC Bus Voltage**	2110	0x0839	16-bit	1 V	**Process Data Out 7**. Default mapping is Parameter ID 7.
4	**Output Power**	2108	0x0837	16-bit	0.1 %	**Process Data Out 5**. Default mapping is Parameter ID 5.
5	**Output Torque**	2107	0x0836	16-bit	0.1 %	**Process Data Out 4**. Default mapping is Parameter ID 4.
6	**Reference Frequency**	2103	0x0832	16-bit	0.01 %	**FB Actual Speed**. This is the reference as a % of max frequency (0-10000 = 0.00-100.00%). To get Hz, calculate: (Value / 10000) * Max Frequency.

Example Modbus RTU Frames
Assumptions:

- **Slave Address:** 0x01 (default)
- **Output Frequency** is mapped to Process Data Out 1 (Register 2104).
- **Motor Current** is mapped to Process Data Out 3 (Register 2106).
- A realistic output frequency is **25.00 Hz**, represented as 2500 (0x09C4).

- A realistic motor current is **12.5 A**, represented as 125 (0x007D) for a 0.1A scaling.
- Writing a **Speed Reference** of **50.00%** (e.g., 25.00 Hz if min/max freq are 0/50Hz) is 5000 (0x1388).
- The **Active Fault Code** register is **2111** (0x083F).

1. Read Motor Current (Register 2106)

- *Request:* Read 1 input register at address 2105 (0x0835). *Note: Address in frame is 0-based: 2106 - 1 = 2105
    - 01 (Slave ID)
    - 04 (Function Code: Read Input Registers)
    - 08 35 (Start Address: 2105)
    - 00 01 (Quantity: 1 register)
    - CRC Calculation on 01 04 08 35 00 01
    - CRC16 Result: 0xD2 0x1F (LSB first)

Request: 01 04 08 35 00 01 D2 1F
Response: 01 04 02 00 7D 78 12 (Data: 0x007D = 125 -> 12.5 A)

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2. Read Output Frequency (Register 2104)

- *Request:* Read 1 input register at address 2103 (0x0833).
    - 01 (Slave ID)
    - 04 (Function Code: Read Input Registers)
    - 08 33 (Start Address: 2103)
    - 00 01 (Quantity: 1 register)
    - CRC Calculation on 01 04 08 33 00 01
    - CRC16 Result: 0x13 0xE3 (LSB first)

Request: 01 04 08 33 00 01 13 E3
Response: 01 04 02 09 C4 B9 F2 (Data: 0x09C4 = 2500 -> 25.00 Hz)

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3. Write Frequency Reference (Set to 50.00%)

- *Request:* Write to holding register 2003 (0x07D1) with value 5000 (0x1388). Note: Address in frame is 0-based: 2003 - 1 = 2002 (0x07D2).
    - 01 (Slave ID)
    - 06 (Function Code: Write Single Register)
    - 07 D2 (Register Address: 2002)
    - 13 88 (Value: 5000)
    - CRC Calculation on 01 06 07 D2 13 88
    - CRC16 Result: 0x1A 0x6B (LSB first)

Request: 01 06 07 D2 13 88 1A 6B
Response: 01 06 07 D2 13 88 1A 6B *(Echoes the request as confirmation)*

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4. Read Active Fault Code (Register 2111)

- *Request:* Read 1 input register at address 2110 (0x083E).
    - 01 (Slave ID)
    - 04 (Function Code: Read Input Registers)
    - 08 3E (Start Address: 2110)
    - 00 01 (Quantity: 1 register)
    - CRC Calculation on 01 04 08 3E 00 01
    - CRC16 Result: 0xF1 0xC3 (LSB first)

Request: 01 04 08 3E 00 01 F1 C3
Response: 01 04 02 00 00 B8 44 (Data: 0x0000 = 0 -> No Active Fault)