**MODBUS RTU REGISTER MAP FOR DRIVES**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Register Address (Dec) | Register Address (Hex) | Name | Data Type | R/W | Description |
| 4097 | **1001h** | **Output Frequency (High)** | UINT16 | R | d001 (High). Monitoring. Resolution: 0.01 Hz. |
| 4098 | **1002h** | **Output Frequency (Low)** | UINT16 | R | d001 (Low). Combined with 1001h for 32-bit value. |
| 4099 | **1003h** | **Output Current** | UINT16 | R | d002. Monitoring. Resolution: 0.1 A. |
| 4100 | **1004h** | **Rotation Direction** | UINT16 | R | d003. 0: Stopping, 1: Fwd, 2: Rev. |
| 4101 | **1005h** | **PID Feedback (High)** | UINT16 | R/W | d004 (High). Monitoring/Setting. Resolution: 0.1. |
| 4102 | **1006h** | **PID Feedback (Low)** | UINT16 | R/W | d004 (Low). Combined with 1005h for 32-bit value. |
| 4103 | **1007h** | **Intelligent Input Status** | UINT16 | R | d005. Bits represent terminals [1] to [8]. |
| 4104 | **1008h** | **Intelligent Output Status** | UINT16 | R | d006. Bits represent terminals [11] to [15] & alarm relay. |
| 4105 | **1009h** | **Scaled Output Freq (High)** | UINT16 | R | d007 (High). Monitoring. Resolution: 0.01. |
| 4106 | **100Ah** | **Scaled Output Freq (Low)** | UINT16 | R | d007 (Low). Combined with 1009h for 32-bit value. |
| 4107 | **100Bh** | **Actual Frequency (High)** | UINT16 | R | d008 (High). Monitoring. Resolution: 0.01 Hz. Range: -40000 to +40000. |
| 4108 | **100Ch** | **Actual Frequency (Low)** | UINT16 | R | d008 (Low). Combined with 100Bh for 32-bit value. |
| 4109 | **100Dh** | **Torque Command** | UINT16 | R | d009. Monitoring. Resolution: 1%. Range: -200 to +200. |
| 4110 | **100Eh** | **Torque Bias** | UINT16 | R | d010. Monitoring. Resolution: 1%. Range: -200 to +200. |
| 4112 | **1010h** | **Torque Monitoring** | UINT16 | R | d012. Monitoring. Resolution: 1%. Range: -200 to +200. |
| 4113 | **1011h** | **Output Voltage** | UINT16 | R | d013. Monitoring. Resolution: 0.1 V. |
| 4114 | **1012h** | **Power Monitoring** | UINT16 | R | d014. Monitoring. Resolution: 0.1 kW. |
| 4115 | **1013h** | **Cumulative Power (High)** | UINT16 | R | d015 (High). Monitoring. Resolution: 0.1. |
| 4116 | **1014h** | **Cumulative Power (Low)** | UINT16 | R | d015 (Low). Combined with 1013h for 32-bit value. |
| 4117 | **1015h** | **Heat Sink Temp** | UINT16 | R | d018. Monitoring. Resolution: 0.1 °C. Range: -200 to 2000. |
| 4118 | **1016h** | **Motor Temperature** | UINT16 | R | d019. Monitoring. Resolution: 0.1 °C. Range: -200 to 2000. |
| 4129 | **1021h** | **DC Bus Voltage** | UINT16 | R | d102. Monitoring. Resolution: 0.1 V. |
| 4130 | **1022h** | **BRD Load Factor** | UINT16 | R | d103. Monitoring. Resolution: 0.1%. |
| 4131 | **1023h** | **Electronic Thermal Load** | UINT16 | R | d104. Monitoring. Resolution: 0.1%. |
| 4353 | **1101h** | **Frequency Source (High)** | UINT16 | R/W | F001 (High). Setting. Valid when A001=03. Resolution: 0.01 Hz. |
| 4354 | **1102h** | **Frequency Source (Low)** | UINT16 | R/W | F001 (Low). Combined with 1101h for 32-bit value. |
| 4355 | **1103h** | **Acceleration Time 1 (High)** | UINT16 | R/W | F002 (High). Setting. Resolution: 0.01 sec. Range: 1-360000. |
| 4356 | **1104h** | **Acceleration Time 1 (Low)** | UINT16 | R/W | F002 (Low). Combined with 1103h for 32-bit value. |
| 4357 | **1105h** | **Deceleration Time 1 (High)** | UINT16 | R/W | F003 (High). Setting. Resolution: 0.01 sec. Range: 1-360000. |
| 4358 | **1106h** | **Deceleration Time 1 (Low)** | UINT16 | R/W | F003 (Low). Combined with 1105h for 32-bit value. |
| 4609 | **1201h** | **Frequency Source Setting** | UINT16 | R/W | A001. Control. 0:Keypot, 1:Term, 2:DigOp, 3:RS485, 4:Opt1, 5:Opt2, 6:Pulse, 7:EasySeq, 10:OpResult |
| 4610 | **1202h** | **Run Command Source** | UINT16 | R/W | A002. Control. 1:Term, 2:DigOp, 3:RS485, 4:Opt1, 5:Opt2 |
| 4611 | **1203h** | **Base Frequency** | UINT16 | R/W | A003. Setting. Resolution: 1 Hz. Range: 30 to Max Freq. |
| 4612 | **1204h** | **Maximum Frequency** | UINT16 | R/W | A004. Setting. Resolution: 1 Hz. Range: 30-400. |
| 4865 | **1301h** | **Operation Command** | UINT16 | R/W | Coil 0001h. 1: Run, 0: Stop (valid when A002 = 03) |
| 4866 | **1302h** | **Rotation Direction Command** | UINT16 | R/W | Coil 0002h. 1: Reverse, 0: Forward (valid when A002 = 03) |
| 4867 | **1303h** | **External Trip** | UINT16 | R/W | Coil 0003h. 1: Trip |
| 4868 | **1304h** | **Trip Reset** | UINT16 | R/W | Coil 0004h. 1: Reset |
| 4875 | **130Bh** | **Intelligent Input Terminal [1]** | UINT16 | R/W | Coil 0007h. Override terminal [1]. 1: ON, 0: OFF |
| ... | **...** | **...** | ... | ... | \*Coils 0008h-000Eh map to terminals [2]-[8]\* |
| 4895 | **131Fh** | **Operation Status** | UINT16 | R | Coil 000Fh. 1: Run, 0: Stop |
| 4896 | **1320h** | **Rotation Direction Status** | UINT16 | R | Coil 0010h. 1: Reverse, 0: Forward |
| 4897 | **1321h** | **Inverter Ready** | UINT16 | R | Coil 0011h. 1: Ready, 0: Not Ready |
| 4899 | **1323h** | **RUN (Tripping)** | UINT16 | R | Coil 0013h. 1: Tripping, 0: Normal |
| 4913 | **1331h** | **Data Writing in Progress** | UINT16 | R | Coil 0049h. 1: Writing, 0: Normal |
| 4914 | **1332h** | **CRC Error** | UINT16 | R | Coil 004Ah. 1: Error, 0: No Error |
| 4915 | **1333h** | **Overrun Error** | UINT16 | R | Coil 004Bh. 1: Error, 0: No Error |
| 4916 | **1334h** | **Framing Error** | UINT16 | R | Coil 004Ch. 1: Error, 0: No Error |
| 4917 | **1335h** | **Parity Error** | UINT16 | R | Coil 004Dh. 1: Error, 0: No Error |
| 4918 | **1336h** | **Sum Check Error** | UINT16 | R | Coil 004Eh. 1: Error, 0: No Error |
| 16 | **0010h** | **Trip Counter** | UINT16 | R | d080. Count of trip events. |
| 18 | **0012h** | **Trip 1 Factor** | UINT16 | R | d081. See Fault Code List below. |
| 19 | **0013h** | **Trip 1 Inverter Status** | UINT16 | R | d081. Status at trip. |
| 20 | **0014h** | **Trip 1 Frequency (High)** | UINT16 | R | d081. Frequency at trip. Resolution: 0.01 Hz. |
| 21 | **0015h** | **Trip 1 Frequency (Low)** | UINT16 | R | d081. Combined with 0014h. |
| 22 | **0016h** | **Trip 1 Current** | UINT16 | R | d081. Current at trip. Resolution: 0.1 A. |
| 23 | **0017h** | **Trip 1 Voltage** | UINT16 | R | d081. DC Voltage at trip. Resolution: 1 V. |
| ... | **...** | **...** | ... | ... | \*Registers 0018h-0039h contain more trip history data for trips 1-6\* |
| 96 | **0060h** | **Enter Command / EEPROM Write** | UINT16 | W | Write 0000: Recalc Motor Constants, 0001: Store Data, Other: Recalc & Store |

**Fault Code List**

**(from Manual Section 4-146)**

The fault code is in the upper byte; the inverter status is in the lower byte of the Trip Factor register.

* **01h**: Overcurrent during constant-speed
* **02h**: Overcurrent during deceleration
* **03h**: Overcurrent during acceleration
* **04h**: Overcurrent during stop
* **05h**: Overload protection (OL1)
* **06h**: Braking resistor overload (OL2)
* **07h**: Overvoltage (OV)
* **08h**: EEPROM error
* **09h**: Undervoltage (UV)
* **0Ah** (10): CT error
* **0Bh** (11): CPU error
* **0Ch** (12): External trip (EXT)
* **0Dh** (13): USP error
* **0Eh** (14): Ground fault (GF)
* **0Fh** (15): Input overvoltage
* **10h** (16): Instantaneous power failure
* **14h** (20): Power module temp (fan stop)
* **15h** (21): Power module temp
* **17h** (23): Gate array comm error
* **18h** (24): Phase loss
* **19h** (25): Main circuit error
* **1Eh** (30): IGBT error
* **23h** (35): Thermistor error
* **24h** (36): Braking error
* **25h** (37): Emergency stop
* **26h** (38): Electronic thermal low speed
* **2Bh** (43): Easy sequence error (invalid instruction)
* **2Ch** (44): Easy sequence error (invalid nesting)
* **2Dh** (45): Easy sequence execution error
* **32h**-**3Bh** (50-59): Easy sequence user trip 0-9
* **3Ch**-**45h** (60-69): Option 1 error 0-9
* **46h**-**4Fh** (70-79): Option 2 error 0-9

**Modbus RTU Example Frames & CRC**

CRC16 is calculated using the standard Modbus polynomial (0xA001, reversed from 0x8005). All examples assume slave address 1 and show CRC in little-endian order (LSB first).

**1. Read Output Current (Register 1003h / d002)**

* **Scaling:** Register value is in 0.1 A units. 123 = 12.3 A.
* **Request:** Read 1 register starting at address 1003h (decimal 4099).
  + 01 03 10 03 00 01
  + CRC Calculation for 01 03 10 03 00 01: 0xD1 0x6B
  + **Full Frame:** 01 03 10 03 00 01 D1 6B
* **Response:** Value of 12.3 A (123 decimal = 0x007B).
  + 01 03 02 00 7B
  + CRC Calculation for 01 03 02 00 7B: 0x79 0x9A
  + **Full Frame:** 01 03 02 00 7B 79 9A

**2. Read Output Frequency (Registers 1001h & 1002h / d001)**

* **Scaling:** 32-bit value. Resolution 0.01 Hz. 5000 = 50.00 Hz.
* **Request:** Read 2 registers starting at address 1001h (decimal 4097).
  + 01 03 10 01 00 02
  + CRC Calculation for 01 03 10 01 00 02: 0x90 0x6C
  + **Full Frame:** 01 03 10 01 00 02 90 6C
* **Response:** Value of 50.00 Hz (5000 decimal = 0x00001388). Assume High word is 1001h, Low word is 1002h.
  + 01 03 04 00 00 13 88
  + CRC Calculation for 01 03 04 00 00 13 88: 0xCB 0xFA
  + **Full Frame:** 01 03 04 00 00 13 88 CB FA
  + **Conversion:** 0x00001388 = 5000 decimal. 5000 \* 0.01 = 50.00 Hz.

**3. Write Frequency Reference (Register 1101h & 1102h / F001)**

* **Scaling:** 32-bit value. Resolution 0.01 Hz. To set 50.00 Hz, write 5000 (0x00001388).
* **Request:** Use Function 16 (0x10) to write 2 registers starting at address 1101h (decimal 4353). Data length is 4 bytes.
  + 01 10 11 01 00 02 04 00 00 13 88
  + CRC Calculation for 01 10 11 01 00 02 04 00 00 13 88: 0x1F 0x6F
  + **Full Frame:** 01 10 11 01 00 02 04 00 00 13 88 1F 6F
* **Response:** Echoes the request's address and quantity.
  + 01 10 11 01 00 02
  + CRC Calculation for 01 10 11 01 00 02: 0x41 0xCF
  + **Full Frame:** 01 10 11 01 00 02 41 CF

**4. Read Active Fault Register (Trip 1 Factor, Register 0012h)**

* **Request:** Read 1 register starting at address 0012h (decimal 18).
  + 01 03 00 12 00 01
  + CRC Calculation for 01 03 00 12 00 01: 0x25 0xCA
  + **Full Frame:** 01 03 00 12 00 01 25 CA
* **Response:** Value of 0x0703 (Overvoltage trip occurred while decelerating).
  + Upper Byte: 07h = Overvoltage (E07)
  + Lower Byte: 03h = Constant-speed operation (See manual 4-146)
  + 01 03 02 07 03
  + CRC Calculation for 01 03 02 07 03: 0x74 0x5A
  + **Full Frame:** 01 03 02 07 03 74 5A

**Priority Register Checklist**

|  |  |  |  |
| --- | --- | --- | --- |
| Function | Register Address (Hex) | Register Name | Details |
| Run/Stop | 0001h (Coil) | Operation Command | Write 1 to Run, 0 to Stop. A002 must be 3. |
| Direction | 0002h (Coil) | Rotation Direction Command | Write 0 for Forward, 1 for Reverse. A002 must be 3. |
| Fault Reset | 0004h (Coil) | Trip Reset | Write 1 to reset a tripped inverter. |
| Frequency Reference | 1101h/1102h | Frequency Source (F001) | 32-bit value. Write desired frequency / 0.01. A001 must be 3. |
| Output Frequency | 1001h/1002h | Output Frequency (d001) | 32-bit value. (Read value) \* 0.01 = Hz. |
| Output Current | 1003h | Output Current (d002) | (Read value) \* 0.1 = Amps. |
| DC Bus Voltage | 1021h | DC Voltage Monitoring (d102) | (Read value) \* 0.1 = Volts. |
| Output Torque | 1010h | Torque Monitoring (d012) | (Read value) = %. Range: -200 to +200. |
| Output Power | 1012h | Power Monitoring (d014) | (Read value) \* 0.1 = kW. |
| Active Fault | 0012h | Trip 1 Factor | Read value. See Fault Code List for interpretation. |