

W10009 / W10019 – WIRELESS TEMPERSTURE SENSOR



Wireless, battery powered sensor. Native modbus map grants seamless integration into the DDC/SCADA system. The communication is based on the encrypted Midam KFP protocol, which allows to update the device firmware on a wireless basis. IP65 protection level ensures reliable function of the sensor even in harsh environment.

GENERAL INFORMATION

This document explains the Modbus protocol for W10009 / W10019 wireless sensors. Modbus is a communication protocol open to all users and supported in common by many manufacturers. The Modbus protocol allows data and setup information to be transferred between a Modbus Master and a Modbus Slave.

250 words can be read at the same time (i.e. 500 bytes).

Type:

- R – register is read only
- W – register is write only
- RW – register is read/write,
- RWE – register is read from EEPROM, write to EEPROM

The supported Modbus functions are:

- 03 Read Holding Registers – read words
- 16 Force Multiple Registers – write words



SPECIFICATIONS

| name | address | type | description | default value |
|-------------------|---------|------|---|--|
| Modbus ID | 1 | R | modbus map identifier | 0xF017 (W-100-09) 0xF018 (W-100-19) |
| FW num | 2 | R | Firmware compatibility version | 401 (4.01) |
| Status | 3 | RW | Bit 8 set: write content of RAM into EEPROM | 0 |
| Device_id | 6 | R | Device identifier .. used by bootloader | 1165 |
| HW num | 7 | R | PCB version | 1 |
| Bootloader FW num | 8 | R | Version of bootloader (0 if application runs) | |
| Name 0 | 9 | RWE | user name, 16 chars | Thermometer 1 (W-100-09) t+ rH meter 1 (W-100-19) |
| Name 1 | 10 | RWE | | |
| Name 2 | 11 | RWE | | |
| Name 3 | 12 | RWE | | |
| Name 4 | 13 | RWE | | |
| Name 5 | 14 | RWE | | |
| Name 6 | 15 | RWE | | |
| Name 7 | 16 | RWE | | |
| RF address Lo | 17 | R | | 0x00A00000 – 0x00AFFFFF |
| RF address Hi | 18 | R | | |
| RF key 0 | 19 | RWE | 16 byte AES key | MIKROKLIMA1234AB |
| RF key 1 | 20 | RWE | | |
| RF key 2 | 21 | RWE | | |

OTHER PARAMETERS

| name | address | type | description | default value |
|----------------------------------|---------|------|--|--|
| RF key 3 | 22 | RWE | | |
| RF key 4 | 23 | RWE | | |
| RF key 5 | 24 | RWE | | |
| RF key 6 | 25 | RWE | | |
| RF key 7 | 26 | RWE | | |
| RF frequency | 27 LSB | RWE | Communication frequency 0..868.95 MHz 100 kBit 1..868.3 MHz 32.768 kBit 2..868.1 MHz 100 kBit 3..869.525 MHz 100 kBit 4..868.3 MHz 38.400 kBit 5..915.3 MHz 100 kBit | 0 (868.95 MHz) |
| RF power | 27 MSB | RWE | Transmission power 0 .. 13 dBm 1 .. 13 dBm 2 .. 10 dBm 3 .. 5 dBm 4 .. 0 dBm 5 .. -5 dBm 6 .. -10 dBm 7 .. -15 dBm 8 .. -20 dBm | 2 (+ 10 dBm) |
| EEPROM writes | 28 | R | number of writes into FLASH | |
| Uptime Lo | 29 | R | uptime in seconds | TRANSMITTED SPONTANEOUSLY Period ~ 10 min |
| Uptime Hi | 30 | R | | TRANSMITTED SPONTANEOUSLY Period ~ 10 min |
| RF background RSSI | 31 LSB | R | signed char background rssi -128 .. +20 dBm | |
| Vbat | 32 LSB | R | x 0.1V Battery voltage | TRANSMITTED SPONTANEOUSLY Period ~ 10 min |
| Bat state | 32 MSB | R | Bit 0..3 battery state, x 10 % 0..10 = 0%..100% 15 not measured yet Bit 7 .. lowbat | TRANSMITTED SPONTANEOUSLY Period ~ 10 min |
| ... | ... | ... | ... | |
| actual temperature | 51 | R | Signed short Actual temperature measured by the sensor incl. correction (see correction temperature) temperature = register value * 0,01 °C | TRANSMITTED SPONTANEOUSLY Period ~ 5 min |
| actual CPU temperature | 52 | R | Signed short Actual temperature measured by the sensor incl. correction (see correction temperature) temperature = register value * 0,01 °C | TRANSMITTED SPONTANEOUSLY Period ~ 10 min |
| ... | ... | ... | ... | |
| actual rH | 54 | R | actual relative humidity = register * 0,01 % | TRANSMITTED SPONTANEOUSLY Period ~ 5 min W-100-19 only |
| ... | ... | ... | ... | |
| measure period | 69 | RWE | measure period in seconds 4 .. 180 sec measure_period = register_value * 1s | 8 (8 s) |
| transmit period | 70 | RWE | Max. RF transmit period 1 – 30 min Transmit_period = min register_value * 1 min | 5 (5 min) Data are transmitted faster if change of value reached threshold value |
| change temperature threshold | 71 | RWE | data are sent immediately if the change is greater than the threshold value 0.10 – 10 °C temp_threshold = register_value * 0.01 °C | 50 (0.50°C) |
| change rH threshold | 72 | RWE | data are sent immediately if the change is greater than the threshold value 0.50 – 20.00 % RH_threshold = register_value * 0.01 % | 200 (2.00%) W-100-19 only |
| change CPU temperature threshold | 73 | RWE | data are sent immediately if the change is greater than the threshold value 0.10 – 10 °C temp_threshold = register_value * 0.01 °C | 200 (2.00°C) |
| ... | ... | ... | ... | |

OTHER PARAMETERS

| name | address | type | description | default value |
|----------------------------|---------|------|--|--------------------------|
| correction temperature | 74 | RWE | Signed short Correction: adds to the actual temperature measured by the sensor -20.00 to 20.00 correction_temp = register * 0,01 °C | 0 (0°C) |
| correction rH | 75 | RWE | Signed short Correction: adds to the actual humidity measured by the sensor Correction_rH = register * 0,01 % | 0 (0 %) W-100-19 only |
| correction CPU temperature | 76 | RWE | Signed short Correction: adds to the actual CPU temperature measured by the CPU internal sensor -20.00 to 20.00 correction_temp = register * 0,01 °C | 0 (0°C) |
| PRG UNI | 77 | R | Bit 0 set .. PRG switch is active Bit 1 set .. UNI switch is active | |
| lock | 78 | RWE | Bit 1 set .. No Rx space for Dongle | 0 (unlocked) |

