

AKO-55424 AKO-55624 AKO-55724 AKO-558241 AKO-558242 AKO-555241 AKO-555242

MODBUS map in AKOAlarm / AKOGas / AKOSecure alarms

Introducción

This document is aimed at describing to the user the operation of the MODBUS RTU communications series protocol implemented by AKO in AKOAlarm and AKOGas alarms. We should take into account that we assume that the user who wants to interact with any of our equipment with communication capacity has some knowledge of the protocol.



IMPORTANT: The functions and parameters described below are available depending on the chosen unit, for more information consult the device's user manual.

Technical specifications

RS-485 communications

Physically speaking, the AKOGas devices can be connected to a RS-485 communications bus with other units. This is a multipoint connection where the maximum distance is 1200* m. The configuration of this bus should be identical to the one presented in the following table:

| RS-485 SERIES CONFIGURATION | |
|-----------------------------|-----------------------------|
| Baud Rate | 9600**, 19200, 38400, 57600 |
| Data length | 8 bits |
| Parity bit | No |
| Stop Bits | 1 bit |

Modbus protocol

The protocol defines a network configuration where a network manager device (master) coexists with one or several slaves, up to a maximum of 32 networked devices (247 in the case of placing repeaters in the RS-485 network).

Among the two transmission modes defined by the protocol: ASCII and RTU (Remote Terminal Unit), AKO adopts the RTU mode. It must be said that in a network of devices connected via the MODBUS protocol, devices cannot be shared using different transmission modes.

The datagram format in RTU format is:

| Start frame | Address | Function | Data | CRC | End frame |
|-------------|-------------------|-----------|-------------------|-----------|-----------|
| 3.5T | 1 byte (1 to 247) | 1 integer | Max. 126 integers | 1 integer | 3.5 T |

←————— Maximum length 255 bytes —————→

The maximum data unit is the integer (2 bytes)

T is the time of transition of one character.

Defined MODBUS functions

AKO solves the management of its devices using several basic functions of the MODBUS protocol:

| Function | Definition | Description of operation |
|----------|---------------------------|--------------------------|
| 03 | Read holding registers | Reading of multiple logs |
| 06 | Preset single registers | Writing a log |
| 16 | Preset multiple registers | Writing of multiple logs |

Definitions

| Types of log | |
|-----------------|---|
| N | Numeric value. |
| Nx10 | Numeric value multiplied by 10, it has to be divided by 10 to represent it correctly. |
| Nx100 | Numeric value multiplied by 100, it has to be divided by 100 to represent it correctly. |
| UTF8 | 2 bytes utf8 (to represent texts) |
| BITS | Bit map, each bit represents a value, 0 = not active, 1 = active. |
| Types of access | |
| R | Read-only. (Parameters to display to the user in the parameter section) |
| W | Read and write. (Parameters to display to the user in the parameter section) |

* Maximum distance at 9600 baud, the distance is reduced on increasing the baud rate.

**Default value.

Parameters

It allows the user to display and edit the operating parameters.

| Register | Type | Access | Parameter | Description | Range | Min. | Def. | Max. |
|----------|------|--------|-----------|----------------------------|---|------|--------|--------|
| 200 | N | W | | MODBUS address | 1 - 247 | 1 | 1 | 247 |
| 201 | N | W | | Communication speed | 0 = 9600bps 1 = 19200bps 2 = 38400bps 3 = 57600bps | 0 | 0 | 3 |
| 300 | UTF8 | W | | Input 1, Name (Part 1) | 0 - 0xffff | 0 | 0x496e | 0xffff |
| 301 | UTF8 | W | | Input 1, Name (Part 2) | 0 - 0xffff | 0 | 0x2031 | 0xffff |
| 302 | UTF8 | W | | Input 1, Name (Part 3) | 0 - 0xffff | 0 | 0 | 0xffff |
| 303 | UTF8 | W | | Input 1, Name (Part 4) | 0 - 0xffff | 0 | 0 | 0xffff |
| 304 | UTF8 | W | | Input 1, Name (Part 5) | 0 - 0xffff | 0 | 0 | 0xffff |
| 305 | UTF8 | W | | Input 1, Name (Part 6) | 0 - 0xffff | 0 | 0 | 0xffff |
| 306 | UTF8 | W | | Input 1, Name (Part 7) | 0 - 0xffff | 0 | 0 | 0xffff |
| 307 | UTF8 | W | | Input 1, Name (Part 8) | 0 - 0xffff | 0 | 0 | 0xffff |
| 315 | UTF8 | W | | Input 2, Name (Part 1) | 0 - 0xffff | 0 | 0x496e | 0xffff |
| 316 | UTF8 | W | | Input 2, Name (Part 2) | 0 - 0xffff | 0 | 0x2032 | 0xffff |
| 317 | UTF8 | W | | Input 2, Name (Part 3) | 0 - 0xffff | 0 | 0 | 0xffff |
| 318 | UTF8 | W | | Input 2, Name (Part 4) | 0 - 0xffff | 0 | 0 | 0xffff |
| 319 | UTF8 | W | | Input 2, Name (Part 5) | 0 - 0xffff | 0 | 0 | 0xffff |
| 320 | UTF8 | W | | Input 2, Name (Part 6) | 0 - 0xffff | 0 | 0 | 0xffff |
| 321 | UTF8 | W | | Input 2, Name (Part 7) | 0 - 0xffff | 0 | 0 | 0xffff |
| 322 | UTF8 | W | | Input 2, Name (Part 8) | 0 - 0xffff | 0 | 0 | 0xffff |
| 330 | UTF8 | W | | Input 3, Name (Part 1) | 0 - 0xffff | 0 | 0x496e | 0xffff |
| 331 | UTF8 | W | | Input 3, Name (Part 2) | 0 - 0xffff | 0 | 0x2033 | 0xffff |
| 332 | UTF8 | W | | Input 3, Name (Part 3) | 0 - 0xffff | 0 | 0 | 0xffff |
| 333 | UTF8 | W | | Input 3, Name (Part 4) | 0 - 0xffff | 0 | 0 | 0xffff |
| 334 | UTF8 | W | | Input 3, Name (Part 5) | 0 - 0xffff | 0 | 0 | 0xffff |
| 335 | UTF8 | W | | Input 3, Name (Part 6) | 0 - 0xffff | 0 | 0 | 0xffff |
| 336 | UTF8 | W | | Input 3, Name (Part 7) | 0 - 0xffff | 0 | 0 | 0xffff |
| 337 | UTF8 | W | | Input 3, Name (Part 8) | 0 - 0xffff | 0 | 0 | 0xffff |
| 345 | UTF8 | W | | Input 4, Name (Part 1) | 0 - 0xffff | 0 | 0x496e | 0xffff |
| 346 | UTF8 | W | | Input 4, Name (Part 2) | 0 - 0xffff | 0 | 0x2034 | 0xffff |
| 347 | UTF8 | W | | Input 4, Name (Part 3) | 0 - 0xffff | 0 | 0 | 0xffff |
| 348 | UTF8 | W | | Input 4, Name (Part 4) | 0 - 0xffff | 0 | 0 | 0xffff |
| 349 | UTF8 | W | | Input 4, Name (Part 5) | 0 - 0xffff | 0 | 0 | 0xffff |
| 350 | UTF8 | W | | Input 4, Name (Part 6) | 0 - 0xffff | 0 | 0 | 0xffff |
| 351 | UTF8 | W | | Input 4, Name (Part 7) | 0 - 0xffff | 0 | 0 | 0xffff |
| 352 | UTF8 | W | | Input 4, Name (Part 8) | 0 - 0xffff | 0 | 0 | 0xffff |
| 400 | UTF8 | W | | Cold room 1, Name (Part 1) | 0 - 0xffff | 0 | 0x436f | 0xffff |
| 401 | UTF8 | W | | Cold room 1, Name (Part 2) | 0 - 0xffff | 0 | 0x6f6c | 0xffff |
| 402 | UTF8 | W | | Cold room 1, Name (Part 3) | 0 - 0xffff | 0 | 0x2072 | 0xffff |
| 403 | UTF8 | W | | Cold room 1, Name (Part 4) | 0 - 0xffff | 0 | 0x6f6f | 0xffff |
| 404 | UTF8 | W | | Cold room 1, Name (Part 5) | 0 - 0xffff | 0 | 0x6d20 | 0xffff |
| 405 | UTF8 | W | | Cold room 1, Name (Part 6) | 0 - 0xffff | 0 | 0x3100 | 0xffff |
| 406 | UTF8 | W | | Cold room 1, Name (Part 7) | 0 - 0xffff | 0 | 0 | 0xffff |
| 407 | UTF8 | W | | Cold room 1, Name (Part 8) | 0 - 0xffff | 0 | 0 | 0xffff |

| Register | Type | Access | Parameter | Description | Range | Min. | Def. | Max. |
|----------|------|--------|-----------|----------------------------|--|------|--------|--------|
| 410 | UTF8 | W | | Cold room 2, Name (Part 1) | 0 - 0xffff | 0 | 0x436f | 0xffff |
| 411 | UTF8 | W | | Cold room 2, Name (Part 2) | 0 - 0xffff | 0 | 0x6f6c | 0xffff |
| 412 | UTF8 | W | | Cold room 2, Name (Part 3) | 0 - 0xffff | 0 | 0x2072 | 0xffff |
| 413 | UTF8 | W | | Cold room 2, Name (Part 4) | 0 - 0xffff | 0 | 0x6f6f | 0xffff |
| 414 | UTF8 | W | | Cold room 2, Name (Part 5) | 0 - 0xffff | 0 | 0x6d20 | 0xffff |
| 415 | UTF8 | W | | Cold room 2, Name (Part 6) | 0 - 0xffff | 0 | 0x3200 | 0xffff |
| 416 | UTF8 | W | | Cold room 2, Name (Part 7) | 0 - 0xffff | 0 | 0 | 0xffff |
| 417 | UTF8 | W | | Cold room 2, Name (Part 8) | 0 - 0xffff | 0 | 0 | 0xffff |
| 420 | UTF8 | W | | Cold room 3, Name (Part 1) | 0 - 0xffff | 0 | 0x436f | 0xffff |
| 421 | UTF8 | W | | Cold room 3, Name (Part 2) | 0 - 0xffff | 0 | 0x6f6c | 0xffff |
| 422 | UTF8 | W | | Cold room 3, Name (Part 3) | 0 - 0xffff | 0 | 0x2072 | 0xffff |
| 423 | UTF8 | W | | Cold room 3, Name (Part 4) | 0 - 0xffff | 0 | 0x6f6f | 0xffff |
| 424 | UTF8 | W | | Cold room 3, Name (Part 5) | 0 - 0xffff | 0 | 0x6d20 | 0xffff |
| 425 | UTF8 | W | | Cold room 3, Name (Part 6) | 0 - 0xffff | 0 | 0x3300 | 0xffff |
| 426 | UTF8 | W | | Cold room 3, Name (Part 7) | 0 - 0xffff | 0 | 0 | 0xffff |
| 427 | UTF8 | W | | Cold room 3, Name (Part 8) | 0 - 0xffff | 0 | 0 | 0xffff |
| 430 | UTF8 | W | | Cold room 4, Name (Part 1) | 0 - 0xffff | 0 | 0x436f | 0xffff |
| 431 | UTF8 | W | | Cold room 4, Name (Part 2) | 0 - 0xffff | 0 | 0x6f6c | 0xffff |
| 432 | UTF8 | W | | Cold room 4, Name (Part 3) | 0 - 0xffff | 0 | 0x2072 | 0xffff |
| 433 | UTF8 | W | | Cold room 4, Name (Part 4) | 0 - 0xffff | 0 | 0x6f6f | 0xffff |
| 434 | UTF8 | W | | Cold room 4, Name (Part 5) | 0 - 0xffff | 0 | 0x6d20 | 0xffff |
| 435 | UTF8 | W | | Cold room 4, Name (Part 6) | 0 - 0xffff | 0 | 0x3400 | 0xffff |
| 436 | UTF8 | W | | Cold room 4, Name (Part 7) | 0 - 0xffff | 0 | 0 | 0xffff |
| 437 | UTF8 | W | | Cold room 4, Name (Part 8) | 0 - 0xffff | 0 | 0 | 0xffff |
| 801 | N | R | PU | Program version | 2800= AKO-555241 AKO-558241 2801= AKO-55241 AKO-558241 2802= AKO-55725 2803= AKO-55424 2804= AKO-55624 | | | |
| 802 | N | R | Pr | Program revision | | | | |
| 803 | N | R | bU | Bootloader version | | | | |
| 804 | N | R | br | Bootloader revision | | | | |
| 805 | N | R | PAr | Parameter map revision | | | | |

Unit status

Allows the user to consult the status of the unit.

Alarms

| Register | Type | Access | Description | Values |
|----------|------|--------|---|--------------------------|
| 1563 | BITS | R | Active Alarms Bit 0 = Error alarm input 1 Bit 1 = Error alarm input 2 Bit 2 = Error alarm input 3 Bit 3 = Error alarm input 4 Bit 4 = Gas Pre Alarm input 1 Bit 5 = Gas Pre Alarm input 2 Bit 6 = Gas Pre Alarm input 3 Bit 7 = Gas Pre Alarm input 4 Bit 8 = Gas alarm input 1 Bit 9 = Gas alarm input 2 Bit 10 = Gas alarm input 3 Bit 11 = Gas alarm input 4 Bit 12 = T.P. alarm input 1 Bit 13 = T.P. alarm input 2 Bit 14 = T.P. alarm input 3 Bit 15 = T.P. alarm input 4 | 0 = Inactive; 1 = Active |
| 1564 | BITS | R | Saved Alarms (Alarms that have been activated since the last time mute was pressed, but not currently active) Bit 0 = Error alarm input 1 Bit 1 = Error alarm input 2 Bit 2 = Error alarm input 3 Bit 3 = Error alarm input 4 Bit 4 = Gas Pre Alarm input 1 Bit 5 = Gas Pre Alarm input 2 Bit 6 = Gas Pre Alarm input 3 Bit 7 = Gas Pre Alarm input 4 Bit 8 = Gas alarm input 1 Bit 9 = Gas alarm input 2 Bit 10 = Gas alarm input 3 Bit 11 = Gas alarm input 4 Bit 12 = T.P. alarm input 1 Bit 13 = T.P. alarm input 2 Bit 14 = T.P. alarm input 3 Bit 15 = T.P. alarm input 4 | 0 = Inactive; 1 = Active |
| 1565 | BITS | R | Muted alerts (Mute) Bit 0 = Error alarm input 1 Bit 1 = Error alarm input 2 Bit 2 = Error alarm input 3 Bit 3 = Error alarm input 4 Bit 4 = Gas Pre Alarm input 1 Bit 5 = Gas Pre Alarm input 2 Bit 6 = Gas Pre Alarm input 3 Bit 7 = Gas Pre Alarm input 4 Bit 8 = Gas alarm input 1 Bit 9 = Gas alarm input 2 Bit 10 = Gas alarm input 3 Bit 11 = Gas alarm input 4 Bit 12 = T.P. alarm input 1 Bit 13 = T.P. alarm input 2 Bit 14 = T.P. alarm input 3 Bit 15 = T.P. alarm input 4 | 0 = Inactive; 1 = Active |

Reading of inputs and outputs

| Register | Type | Access | Description | Values |
|----------|-------|--------|------------------------------|--|
| 1666 | N | R | Maintenance mode status | 0 = Inactive; 1 = Active |
| 1667 | N | R | Set hold mode status | 0 = Inactive; 1 = Active |
| 1004 | N | R | Input 1 | Trapped Person 0 = Error, open circuit 1= Alarm 2= No alarm 3= Short-circuit Gas 0 = Error, open circuit 1= Restart / start-up 2= No alarm 3= Delayed Pre Alarm 4= Pre Alarm 5= Delayed Alarm 6= Alarm 7= Short-circuit |
| 1005 | N | R | Input 2 | |
| 1006 | N | R | Input 3 | |
| 1007 | N | R | Input 4 | |
| 1008 | Nx100 | R | Battery voltage | |
| 1010 | N | R | Relay status TRAPPED PERSON | 0 = Inactive; 1 = Active |
| 1011 | N | R | Relay status SYSTEM FAILURE | 0 = Inactive; 1 = Active |
| 1012 | N | R | Relay status GAS PRE ALARM 1 | 0 = Inactive; 1 = Active |
| 1013 | N | R | Relay status GAS ALARM 1 | 0 = Inactive; 1 = Active |
| 1014 | N | R | Relay status GAS PRE ALARM 2 | 0 = Inactive; 1 = Active |
| 1015 | N | R | Relay status GAS ALARM 2 | 0 = Inactive; 1 = Active |
| 1021 | N | R | Digital input 1 "Mute" | 0 = Inactive; 1 = Active |
| 1022 | N | R | Digital input 2 "Sethold" | 0 = Inactive; 1 = Active |

Keypad

| Register | Type | Access | Description | Values |
|----------|------|--------|---|--------|
| 1028 | N | W | Activation of functions 0 = Inactive 1 = Mute 2 = Autoconfig | |

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