

AKO-5761x

MODBUS map in AKOGas gas detectors

Introducción

This document is aimed at describing to the user the operation of the MODBUS RTU communications series protocol implemented by AKO in the AKOGas detectors. 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
3.5 T	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.

Alarm configuration

Register	Type	Access	Parameter	Description	Range	Min.	Def.	Max.
200	N	R	AL2	Pre-Alarm	0: Disabled 1: Enabled	0	Jumper	1
201	N	R	AL3	Pre-alarm level	AKO-57615 Other models	-	4000	-
202	N	W	AL4	Diferencial Pre-Alarma	0 - (200 or AL3 -1)	0	100	200
203	N	R	AL5	Pre-Alarm Delay	0 - 15	0	0	15
204	N	R	AL6	Alarm Level	AKO-57615 Other models	-	8000	-
205	N	W	AL7	Alarm Differential	0 - (200 or AL6 -1)	0	100	200
206	N	R	AL8	Alarm Delay	0 - 15	0	0	15
207	N	W	AL9	Pre-Alarm level of the second set of levels	AKO-57615 Other models	-	5000	-
208	N	W	AL10	Alarm level of the second set of levels	AKO-57615 Other models	-	9999	-
						-	3000	-

Basic configuration

Register	Type	Access	Parameter	Description	Range	Min.	Def.	Max.
300	N	R	Gc1	Type of sensor	2: AKO-57612 4: AKO-57611/14 3: AKO-57613 5: AKO-57615	2	(1)	5
301	N	W	b03	Function of the mute key	0: Disabled 1: Deactivate acoustic alarm 2: Deactivate relay 3: Deactivate both	0	1	3
302	N	W	b04	Audible alarm	0: Disabled; 1: Enabled	0	(2)	1
303	N	W	b20	MODBUS address	1 - 247	1	1	247
304	N	W	b21	Communication speed	0: 9600 bps 2: 38400 bps 1: 19200 bps 3: 57600 bps	0	0	3

Input and output configuration (In0)

Register	Type	Access	Parameter	Description	Range	Min.	Def.	Max.
400	N	R	I11	Polarity digital input 1 (Remote mute)	0 = Activates on closing contact 1 = Activates on opening contact	0	0	1
403	N	R	I21	Polarity digital input 2 (Remote set hold)	0 = Activates on closing contact 1 = Activates on opening contact	0	0	1

Information (tid)

Register	Type	Access	Parameter	Description	Range	Min.	Def.	Max.
801	N	R	PU	Program version	-	-	-	-
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	-	-	-	-

(1) According to model; (2) According to AUTOCONFIG

Unit status

Allows the user to consult the status of the unit.

Alarms

Register	Type	Access	Description	Values
1547	BITS	R	Active alarms Bit 0 = Pre-Alarm Bit 1 = Alarm Bit 2 = Sensor error Bit 3 = Low temperature sensor error Bit 4 = High temperature sensor error	0 = Inactive; 1 = Active
1548	BITS	R	Alarms saved and not confirmed Bit 0 = Pre-Alarm Bit 1 = Alarm Bit 2 = Sensor error Bit 3 = Low temperature sensor error Bit 4 = High temperature sensor error	0 = Inactive; 1 = Active
1549	BITS	R	Silenced alarms Bit 0 = Pre-Alarm Bit 1 = Alarm Bit 2 = Sensor error Bit 3 = Low temperature sensor error Bit 4 = High temperature sensor error	0 = Inactive; 1 = Active
1550	BITS	R	Maintenance Mode	0 = Inactive; 1 = Active
1551	BITS	R	Set Hold mode	0 = Inactive; 1 = Active
5001	N	R	Pre-Alarm	0 = Inactive; 1 = Active
5003	N	R	Alarm	0 = Inactive; 1 = Active
5004	N	R	Sensor error	0 = Inactive; 1 = Active

Reading of inputs and outputs

1002	N	R	Pre-Alarm relay status	0 = Inactive; 1 = Active
1003	N	R	Alarm relay status	0 = Inactive; 1 = Active
1012	N	R	Acoustic alarm status	0 = Inactive; 1 = Active
1013	N	R	Reading of digital input 1 (Remote mute)	0 = Inactive; 1 = Active
1014	N	R	Reading of digital input 2 (Remote Set Hold)	0 = Inactive; 1 = Active
1019	N	R	Reading of output 4/20 mA	μA

Keypad

Register	Type	Access	Description	Values
20000	BITS	W	Activation of functions Bit 0 = Activation of the Mute function Bit 1 = Activation of the Set Hold mode Bit 2 = Activation of the second set of levels	0 = Inactive; 1 = Active
20001	BITS	R	Function status Bit 0 = Activation of the Mute function Bit 1 = Activation of the Set Hold mode Bit 2 = Activation of the second set of levels	0 = Inactive; 1 = Active

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