



LABOR – ASTER

INDUSTRIAL AUTOMATION



AC 083
QMS

CONVERTER ANALOG ⇒ MODBUS type As 702

- Input 8 analog 4 ÷ 20 mA signal
- Output RS485 MODBUS RTU
- Rail housing
- Explosion-proof designation:
II 3G Ex ec II T4



APPLICATION

Converter **As 702** is designed to collect measurement data in distributed automation systems. Its main destination is conversion 8 analog signals to digital serial transmission MODBUS RTU. Converter operates as a SLAVE unit (it waits for requests from MASTER unit according to the list of transmission frames).

Converter **As 702** is adapted to be mounted in control closets on rail TS35.

BASIC TECHNIAL PARAMETERS:

- Power supply - 24 V_{DC} ± 10 % / < 70mA
- Measurement inputs - differential 8 x 0(4)÷20mA or 8 x 0 ÷ 10 V
 - Max common voltage to power supply ground - ± 66 V_{DC}
 - Input resistance
 - for 0(4)÷20 mA - 100 Ω
 - for 0÷10 V - ≥ 250 kΩ
 - Accuracy class - 0.25 %
 - Resolution - 0.025 %
 - Measurement rate - < 0.5 s
 - Input circuits separation - high resistance
- Output - RS485 MODBUS RTU
 - Transmission baudrate - 2400; 4800; 9600; 19200 bd
 - Data bits - 8
 - Stop bit - 1
 - Parity - no
 - Max number of units on the bus - 31
- Length of transmission cable - max 1200 m
- Transmission line separation - opto-electric
- Programmable parameters - baudrate, device number, filtration factor
- Vibrations - 0,1 mm
- Operation state indication:
 - power supply - LED1
 - data transmission - LED2

TRANSMISSION BAUDRATE:

- 0 – 19200 ; 1 – 9600
- 2 – 4800 ; 3 – 2400

FILTRATION FACTOR:

- 0 – no filtration ; 1 – 1 s ; 2 – 2 s
- 3 – 4 s ; 4 – 8 s ; 5 – 16 s
- 6 – 32 s ; 7 – 64 s

List of transmission frames:

- Frame 04 - read measurement inputs
- Frame 03 - read config registers
- Frame 06 - write config register

List of input measurements index:

INDEX	INPUT
00	AI 1
01	AI 2
02	AI 3
03	AI 4
04	AI 5
05	AI 6
06	AI 7
07	AI 8

TRANSMISSION DATE FORMAT:

ANALOG VARIABLES		DEC	HEX
0V	0 mA	0	0
	4 mA	819	333
10V	20 mA	4096	1000

List of config parameters:

INDEX	SYMBOL	PARAMETER
00	Nr. S	Device number
01	BAUD	Transmission baudrate
02	WF1	Filtration factor for AI 1
03	WF2	Filtration factor for AI 2
04	WF3	Filtration factor for AI 3
05	WF4	Filtration factor for AI 4
06	WF5	Filtration factor for AI 5
07	WF6	Filtration factor for AI 6
08	WF7	Filtration factor for AI 7
09	WF8	Filtration factor for AI 8

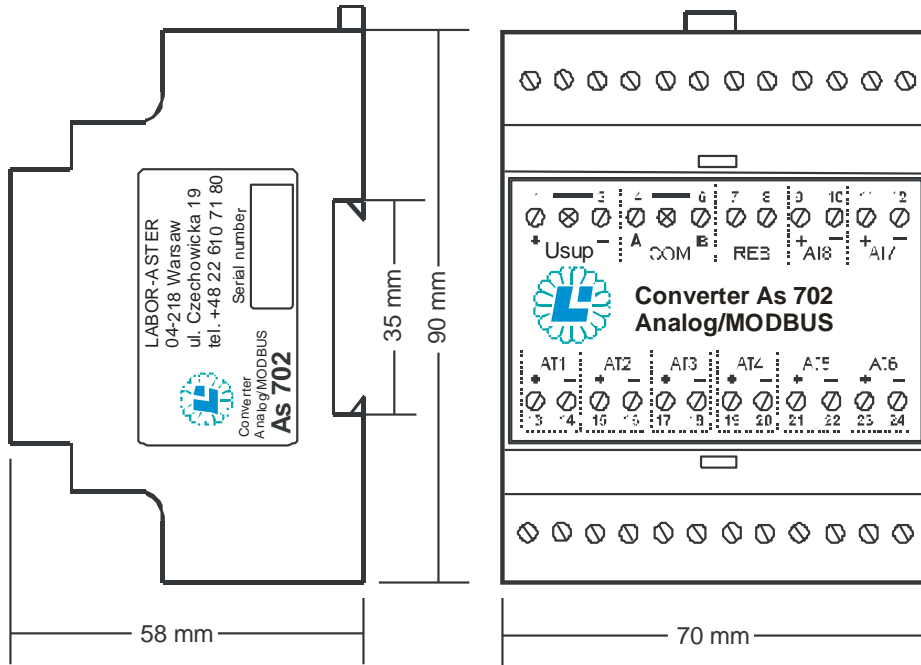
Converter operation with factory settings:

- Connect a jumper to **RES** input.
- Program device number and transmission baudrate.
- Disconnect the jumper from **RES** input

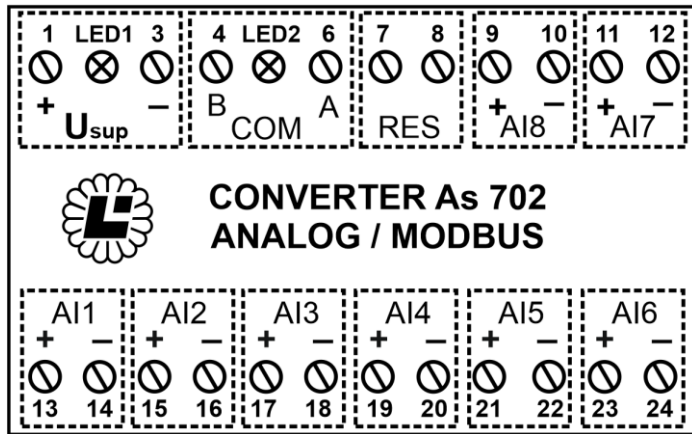
Shorting input **RES** sets operation of transmission to factory settings:

- Device number = 247 (Ø F7 hex)
- Baudrate = 1 (9600b/s)

DIMENSIONS:



HOW TO CONNECT:



TERMINAL		
1	+	Supply 24V _{DC}
3	-	
4	LED1	Supply indication
6	B	RS485 MODBUS RTU
5	A	
7	LED2	Transmission indication
8	RESET	Set factory settings
9	+	Analog input 8
10	-	
11	+	Analog input 7
12	-	
13	+	Analog input 1
14	-	
15	+	Analog input 2
16	-	
17	+	Analog input 3
18	-	
19	+	Analog input 4
20	-	
21	+	Analog input 5
22	-	
23	+	Analog input 6
24	-	

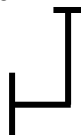
HOW TO ORDER:

Converter As 702 - X

Analog inputs:

0/4 ÷ 20 mA - 0

0 ÷ 10 V - 1



Group II category 3 device with designation based the process of product quality assurance according to module A of ATEX directive: II 3G Ex ec II T4 Gc.

Standards connect with the designation II 3G Ex ec II T4: PN-EN 60079-7:2016-02, PN-EN IEC 60079-0:2018-09

The converter can be installed in any explosion hazardous zone in an explosion-proof designed enclosure (e.g. flameproof enclosure) or in other enclosure according to the applicable rules. Basing on designation II 3G Ex ec II T4 Gc (category 3 device) the converter can be installed in explosion hazardous zone 2 according to the rules below.

CONDITIONS OF USE:

External connections should be led with cables of a wire core diameter $0,5 \div 2,5\text{mm}^2$.

The converter can be installed in a hazardous zone in a flameproof enclosure (or other according to the applicable rules). Using the converter in explosive group I does not require placing on the enclosure a warning and after the power supply is turned off it can be taken out of the housing without a delay. In case of using the converter in explosive group II on the outside part of the enclosure should be placed a warning "Do not open the housing within 10 min. after turning off the power."

For installation in zone 2:

- 1) The housing provides a minimum degree of protection IP20. The device can be installed inside a building provided it is protected against dirt, dust, especially conductive dust, extreme mechanical exposures (eg vibrations, impacts, shocks), and thermal stress.
- 2) Installation outside the building requires an additional enclosure with a higher degree of protection minimum IP54 or higher, eg IP65, in accordance with the surrounding environment in which the installation operates. It may be an enclosure **without an explosion-proof designation**, but:
 - with the warning label "Caution: risk of electrostatic discharge" (see point 6).
 - provided that it will be mounted with protection against falls and mechanical impacts.
- 3) It is the safest to install the device in zone 2, both inside and outside of the building, in an explosion-proof designed enclosure (eg with an "Ex e" protection level) providing a minimum IP54 protection degree or higher (eg IP65) in accordance with the surrounding environment in which the installation operates.
- 4) Regardless of the place of installation, the devices must be protected against dirt, dust, especially conductive dusts, extreme mechanical infections (eg vibrations, impacts, shocks) and thermal stress.
- 5) In order to prevent self-loosing of cables in non-intrinsically safe screw terminals numbers 8, 7, 5, 6 one should place non-tinned cables in each of the clamp:
 - a single wire or cable with a twisted tip with a cross-section of $0,25 \div 2,5\text{ mm}^2$. It is recommended to use a tube sleeve with plastic crimped by a specialized tool..
 - 2 cables with the same cross-section of $0,5 \div 1,5\text{ mm}^2$ type wire with a twisted tip placed in a common tube sleeve with plastic crimped by a specialized tool.Tighten the terminal firmly with a torque of 0.5 Nm (typically 2 kfg force on the handle of a screwdriver with a diameter of 2.5 cm) with a flat screwdriver 3.0...3.5 mm wide. Every 6 months, check the tightening of the terminals by tightening with a torque of 0.5 Nm using a screwdriver with a width of 3...3.5 mm.
- 6) If the housing needs cleaning, use a cloth lightly moistened with a mixture of detergent and water.
Electrostatic hazard: to avoid the risk of electrostatic discharge, the casing of the device and / or the enclosure in which the device is installed should be cleaned only with a damp or antistatic cloth (soaked in antistatic liquid).
Avoid any penetration of cleaning liquid into the interior to prevent damage to the device.
- 7) Non-intrinsically safe circuits (including 24Vdc power supply) must be connected to power suppliers and devices galvanically separated from the power grid (SELV or SELV-E circuits) with a CE designation.
- 8) If an explosive atmosphere is present or can occur, non-intrinsically safe terminals numbers 8, 7, 5, 6 must not be connected/disconnected to/from cables of non-intrinsically safe circuits with voltage. If an explosive atmosphere is present or can occur during service work, disconnect non-intrinsically safe circuits only in the safe area. If there is no explosive atmosphere during service work, the above-mentioned principles from point 8 are not required.

Operation conditions:

Ambient temperature - storage	-	-30 ÷ +70°C
Ambient temperature - operating	-	-10 ÷ +60°C
Relative Humidity	-	max 85% without condensation
Environment	-	no dusts and aggressive gases
Working position	-	any

Production and distribution:

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The manufacturer reserves the possibility to modify the product.

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