

SYMBOLS



Attention,
Risk of Danger,
Warning



High Voltage,
Risk of
Electric Shock



Double /
Reinforced
Insulation



NOT
Litter

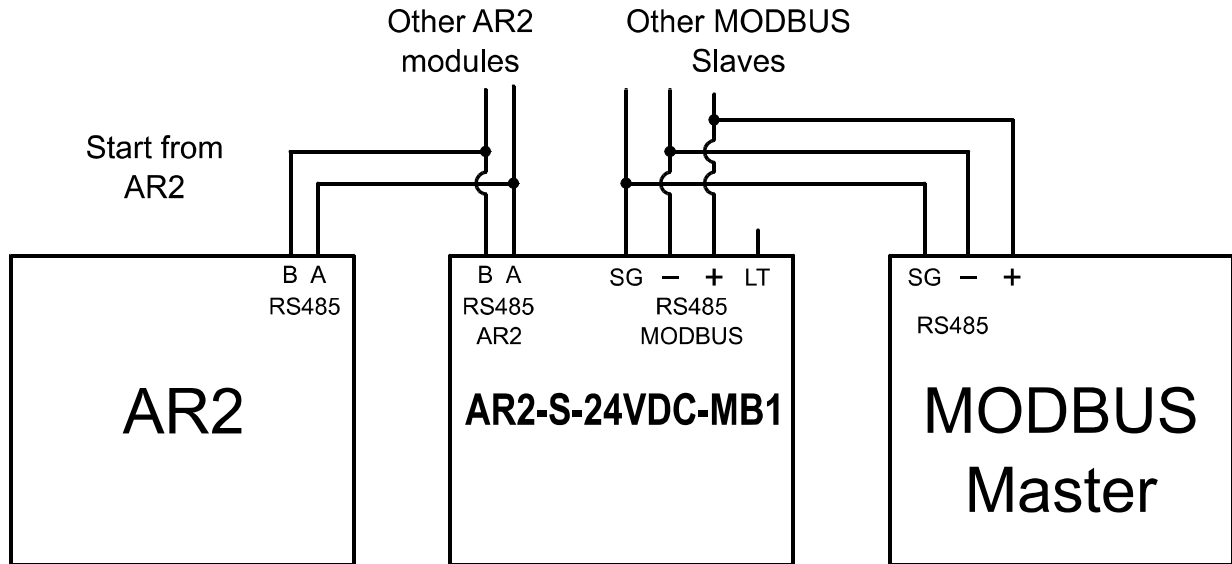


CE Mark

PRODUCT DESCRIPTION

- This device is designed for basic automatic control applications.
- Free of charge Ladder Logic Editor with GUI running on PC, "GEMO LADDER EDITOR"; programming, simulation, download.
- 2 independent RS-485 communication ports
- Connects to AR2 AR2 RS-485 communication line
- Connects to MODBUS RS-485 line as a slave
- Supported MODBUS protocols; only MODBUS RTU on a RS-485 line
- Selectable communication speed for MODBUS connection
- Selectable "Parity/Stop Bit" for MODBUS connection
- Selectable slave address on MODBUS line
- Data security on MODBUS line; selectable "Read" permission
- Data security on MODBUS line; selectable "Write" permission
- Selectable response delay; adaptable to slow/non-real time masters
- LEDs on front panel; ability to monitor communication status
- Loads communication parameters automatically from AR2; no extra/special user adjustment
- Selectable internal line termination for MODBUS line for easy commissioning
- Wide range isolated supply input; 18..32VDC

RS-485 CONNECTION



AR2-S-24VDC-MB1 has a selectable internal line termination for MODBUS line for easy commissioning that can be activated easily with an external bridge connection. Please consult to the following documentation for line termination details advised for a MODBUS RS-485 line;

"MODBUS over Serial Line Specification & Implementation guide V1.0, MODBUS.ORG, 12/02/02,
http://www.modbus.org/docs/Modbus_over_serial_line_V1.pdf"

INSTALLATION, USE and WARNINGS



- This device and its packing is NOT litter and may NOT be disposed of with domestic waste. Please return this device and its packing to an appropriate recycling point at the end of its service life.
- Please read this user manual and “GEMO Ladder Editor” user manual carefully and completely before installation and use. Please take into consideration all warnings mentioned in these manuals.
- This device is suitable only for permanent rail mounting.
- Installation and use of this device must be done by qualified, authorized and trained technical personnel only.
- Inspect device carefully before installation. Do not install and use broken and defective devices.
- Do not disassemble device. Do not make any repair on any part of the device. There is no accessible part inside the device. Please contact to manufacturer for broken and defective devices.



- Do not use device in environments subject to flammable, explosive and corrosive gases and/or substances.
- This device is not suitable for medical and residential use. This device is not suitable for use related with human health and safety. This device is not suitable for automotive, military and marine use.
- Do not allow children and unauthorized people to use this device.
- Before installation and any technical work, disconnect the power supply and mains connections.
- Check the power supply voltage level before power on, and make sure voltage level is in specified limits.



- Connect an external power switch and an external fuse (1A, 250VAC) to the power supply line that are easily accessible for rapid intervention.
- Use appropriate cables for power supply and mains connections. Apply safety regulations during installation.
- Install the device in a well ventilated place. Install the device permanently on a rail.
- Do not operate the device other then the environmental conditions given in Technical Specification.
- Do not operate the device in environments that may cause conductive pollution.
- Take precautions against negative environmental conditions like humidity, vibration, pollution and high/low temperature during installation.



- Keep device, signal cables and communication cables away from circuit breakers, power cables and devices/cables emitting electrical noise. Use shielded and twisted signal and communication cables and connect shield to earth ground on device side. Keep length of signal and communication cables less than 3m.
- In your applications, always use separate and independent mechanical and/or electromechanical devices/apparatus (other then this device) to support this device to handle emergency cases.
- Use insulated cable end-sleeves at the end of cables screwed to the device connector terminals.
- Maximum torque for screwing; 0.5 N.m.
- You can download “GEMO Ladder Editor” and its user’s manual to program AR2 from web site www.gemo.com.tr free of charge.
- Please check www.gemo.com.tr for latest editor, device and documentation updates regularly. All updates and all information are subject to change without notice.







- Use twisted pair shielded (24 AWG) cable for RS-485 connection.
- Line termination may be required. Refer to “RS-4854 Connection” section for details.
- RS-485 lines are isolated from supply input (max. isolation voltage 40VAC).
- RS-485 lines are NOT isolated from each other.
- Please refer to MODBUS addressing and communication settings; http://www.gemo.com.tr/ar2_tr.htm

CLEANING



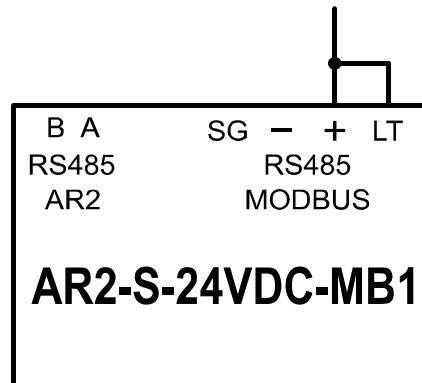
- Do not use any solvents (alcohol, thinners, benzine, acid, etc.) or corrosive substances to clean the device. Use only a dry and clean non-abrasive cloth. Before cleaning, disconnect the power supply and mains connections.

TECHNICAL SPECIFICATIONS

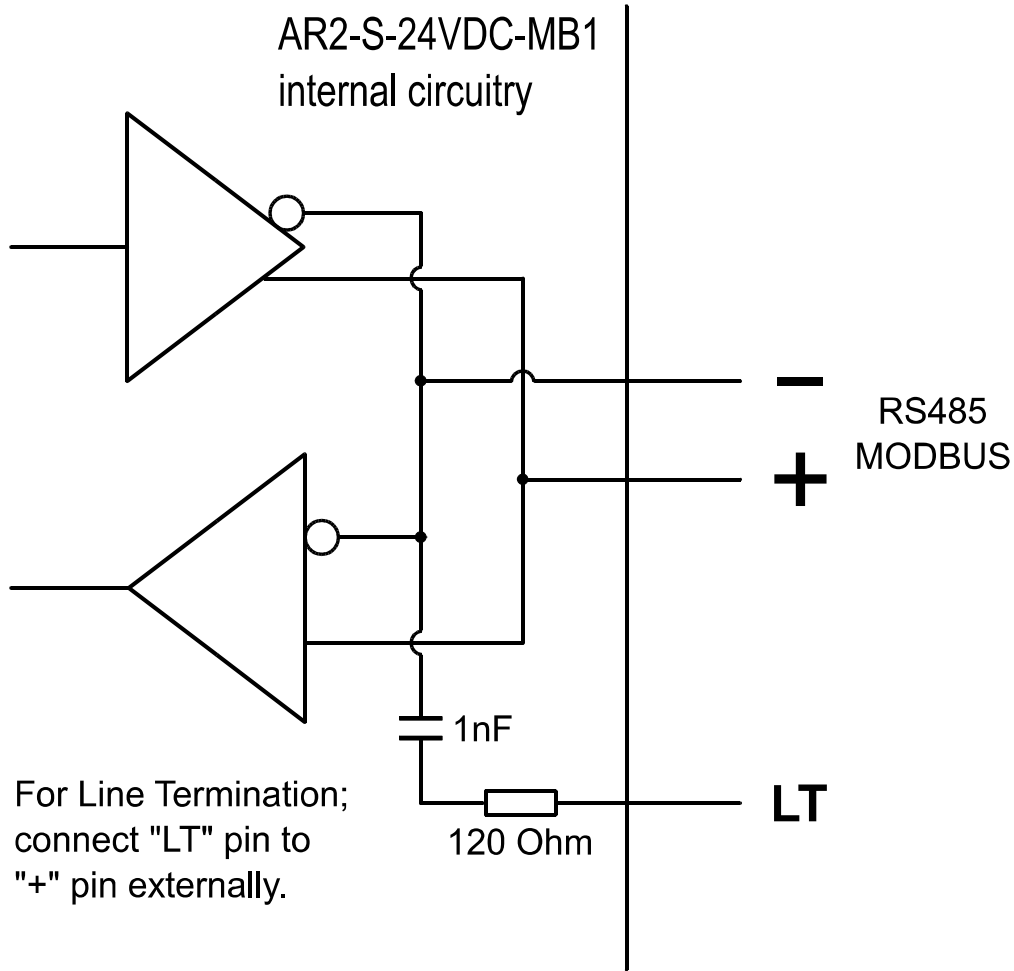
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 - **Programming** : Free of charge Ladder Logic Editor with GUI running on PC, "GEMO LADDER EDITOR"; programming, simulation, download. You can download from www.gemo.com.tr free of charge. AR2-S-24VDC-MB1 loads MODBUS parameters automatically from AR2 smart relay/PLC.
 - **AR2 connection** : RS-485
 - **MODBUS connection** : RS-485
 - **MODBUS protocol** : Only MODBUS RTU
 - **MODBUS device** : Acts as a MODBUS slave on a RS-485 MODBUS line
 - **MODBUS comm. speed**: Selectable; 9600, 19200, 38400 baud
 - **MODBUS comm. "Parity/Stop Bit"**: Selectable; "1 Stop Bit, Even Parity", "1 Stop Bit, Odd Parity", "1 Stop Bit, No Parity", "2 Stop Bits, No Parity"
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 - **Data security** : "Read" and "Write" permission assigned separately by user.
 - **Response time** : Max.: 150 milliseconds, Expected; less then 50 milliseconds (excluding message receiving and transmitting duration).
 - **Extra response delay** : Assigned by user; up to extra 250 milliseconds
 - **RS-485 Line termination**: Line termination for the MODBUS line may be required. Please refer to "RS-485 Connection" and "Internal Line Termination Circuitry" sections for details.
 - **Internal line termination circuitry**: 1nF and 120 Ohm in series.
 - **Line termination activation** : Short circuit ("LT") pin to ("+") pin of MODBUS RS-485 line externally.
 - **RS-485 cable** : Twisted pair and shielded; 24 AWG, (connect shield to earth at one end only).
 - **Torque for screwing** : max. 0.5 N.m
 - **Supply Voltage** : 18..32VDC (isolated; max. isolation voltage 40VAC from RS-485 lines). RS-485 lines are NOT isolated from each other
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 - **Power Consumption** : less then 3W
 - **Operating Temperature**: 0°C .. 50°C
 - **Storage Temperature** : -10°C..60°C (without icing)
 - **Humidity** : %80 up to 30°C, then linearly decreases to 50% at 50°C (non-condensing)
 - **Operating Altitude** : less then 2000 m
 - **Protection Class** : IP20; according to EN 60529
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 - **EMC** : TS EN 61000-6-2:2019, IEC 61000-6-2:2016 RLV
TS EN 61000-6-4:2020, IEC 61000-6-4:2018 RLV
 - **Safety** : TS EN 61010-1:2012 + A1:2019 + A1/AC:2019
 - **Dimensions** : 70x117x37mm, with connectors plugged in
 - **Weight** : less then 0.4 kg

ACTIVATION of INTERNAL LINE TERMINATION CIRCUITRY

- Short circuit ("LT") pin to ("+") pin of MODBUS RS-485 line externally.



INTERNAL LINE TERMINATION CIRCUITRY



AR2-S-24VDC-MB1 has an internal line termination circuitry for the MODBUS RS-485 line that can be activated easily with an external connection.

Internal line termination circuitry is composed of an "1nF" capacitor connected series with an "120 Ohm" resistor connected in series. One end of the line termination circuitry is connected to ("-") pin of MODBUS RS-485 connection internally. The other end is connected to ("LT") pin for external activation.

In order to activate internal line termination circuitry, simply short circuit ("LT") pin to ("+") pin of MODBUS RS-485 line.

Line termination may be required only for the devices at the end of a RS-485 line (2 devices only). Line termination is not done for the devices connected somewhere in between the two ends.

Internal line termination circuitry may not always give a good result for your application. Please check communication performance before and after line termination is done.

For details of line termination on an RS-485 MODBUS line, please refer to:
"MODBUS over Serial Line Specification & Implementation guide V1.0, MODBUS.ORG, 12/02/02,
http://www.modbus.org/docs/Modbus_over_serial_line_V1.pdf"