

# AR540

## TWO-CHANNEL LARGE DISPLAY WITH STANDARD MATHEMATICAL FUNCTIONS, ALARMS AND CLOCK



4 COLORS  
DISPLAY  
2672  
2672  
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2672

- control of temperature and other physical parameters (humidity, pressure, level, speed, etc.) processed into a standard electric signal (0/4÷20mA, 0÷10V, 0÷60mV, 0÷2,5kΩ)
- 2 universal measuring inputs (thermoreistance, thermocouple and analogue) with additional features:
  - mathematical (difference, sum and average of measurements from two inputs)
  - with measured minimum and maximum value saved in the memory
  - remote data display (via MODBUS-RTU, slave)
- real-time clock displayed alternately with measurements
- programmable display colours for measurement channels, clock, LED indicators and alarms
- 2 independent on/off alarm outputs (ON-OFF, heating, cooling, relative alarms, manual mode) with LED indication and a colour display
- BIN digital input for switching the operating mode: start/stop for outputs, manual/automatic mode for outputs, two-position switching of the set value (day/night) for alarms, display "Hold" feature for measurements, changing or stopping the switching of displayed channels, direct display of measured value inputs (for mathematical functions), etc.
- analogue output 0/4÷20mA or 0/2÷10V (alarm, retransmission)
- option of converting an input signal into a standard analogue output
- selecting control value outputs (input, difference, sum, average from measurements)
- manual mode (open control loop) available for binary and analogue outputs, setting the value of the output signal in the range of 0 ÷ 100%, option of auto-activation due to sensor failure
- built-in 24Vdc/50mA power supply adapter for supplying on-site transducers
- RS485 serial interface, galvanically isolated, MODBUS-RTU, slave
- compensation of line resistance for resistance sensors
- temperature compensation of thermocouple cold ends
- programmable display values (measurements, mathematical or remote functions), input types, indication ranges (for analogue inputs), alarm options, communication, access, display and other parameters
- option of protecting access to the configuration of parameters with user password
- methods for configuring parameters:
  - via membrane keyboard (IP65), located on the front panel of the device
  - via RS485 or PRG (programmer AR956/955) and freeware ARsoft-LOG (Windows 7/8/10), MODBUS-RTU
- software and programmer allow you to view the measured value and quickly configure single or few sets of parameters previously saved in the computer for re-use, e.g. in other devices of the same type (duplicate configuration)
- high accuracy, long-term stability and immunity to interference
- optional to choose (in the ordering method): power supply 24Vac/dc, output SSR, analog output 0/2÷10V

### Contents of set:

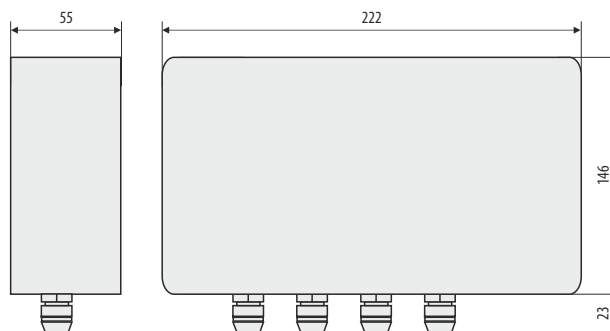
- display
- user manual

### Available accessories:

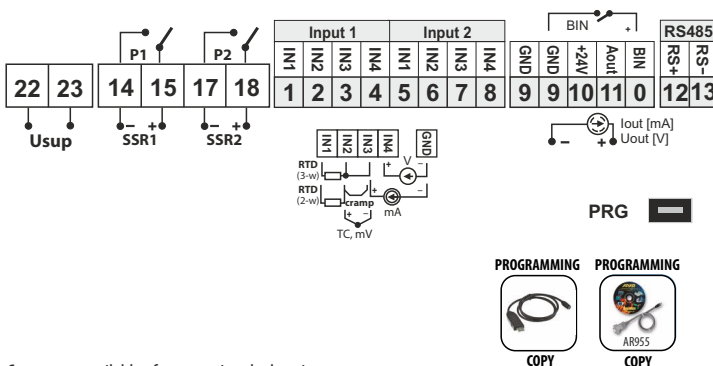
- programmer AR956 or AR955
- RS485 to USB converter

### DIMENSIONS, INSTALLATION DATA

Enclosure type	industrial IP65, Gainta G218
Enclosure dimensions	222 x 146 x 55 mm (S x W x G)
Fixing methods	4 holes Ø4,3 mm, spacing 210x116 mm, available after removing the front cover
Material	polycarbonate
Conductor cross-sections (for detachable	2,5mm <sup>2</sup> (supply, bi-state outputs), 1,5mm <sup>2</sup> (other)



### TERMINAL STRIPS, ELECTRICAL CONNECTIONS

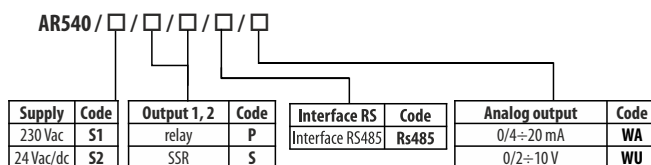


Connectors available after removing the housing cover.

Insert electric wires into the housing through cable glands (M12x1,5)

PRG - socket located on the display board (do not use simultaneously with RS485)

### ORDERING PROCEDURE



### For example:

AR540 / S1 / P / P / RS485 / WA

AR540, supply 230 Vac, 2 relay outputs (interface RS485, output 0/4÷20 mA)

## TECHNICAL DATA

Universal inputs (programmable)	measurement ranges
- Pt100 (RTD, 3- or 2-wire)	-200 ÷ 850 °C
- Ni100 (RTD, 3- or 2-wire)	-50 ÷ 170 °C
- Pt500 (RTD, 3- or 2-wire)	-200 ÷ 620 °C
- Pt1000 (RTD, 3- or 2-wire)	-200 ÷ 520 °C
- thermocouple J (TC, Fe-CuNi)	-40 ÷ 800 °C
- thermocouple K (TC, NiCr-NiAl)	-40 ÷ 1200 °C
- thermocouple S (TC, PtRh 10-Pt)	-40 ÷ 1600 °C
- thermocouple B (TC, PtRh30PtRh6)	300 ÷ 1800 °C
- thermocouple R (TC, PtRh13-Pt)	-40 ÷ 1600 °C
- thermocouple T (TC, Cu-CuNi)	-25 ÷ 350 °C
- thermocouple E (TC, NiCr-CuNi)	-25 ÷ 820 °C
- thermocouple N (TC, NiCrSi-NiSi)	-35 ÷ 1300 °C
- current ( $R_{in} = 50 \Omega$ )	0/4 ÷ 20 mA
- voltage ( $R_{in} = 110 k\Omega$ )	0 ÷ 10 V
- voltage ( $R_{in} > 2 M\Omega$ )	0 ÷ 60 mV
- resistance (3- or 2-wire)	0 ÷ 2500 $\Omega$
- remote data display (via RS485 or PRG port)	-1999 ÷ 9999
<b>Number of measurement inputs</b>	2
<b>Response time for measurements</b> (10 ÷ 90%)	0,5 ÷ 4 s (programmable)
<b>Resistance of leads</b> (RTD, $\Omega$ )	$R_L < 25 \Omega$ (for each line)
<b>Resistance current</b> (RTD, $\Omega$ )	400 $\mu$ A (Pt100, Ni100), 200 $\mu$ A (remaining)
<b>Processing errors</b> (at 25°C ambient temperature):	
- basic	- for RTD, mA, V,mV, $\Omega$ - for thermocouple
	0,1 % of measuring range $\pm$ 1 digit 0,2 % of measuring range $\pm$ 1 digit
- additional for thermocouples	<2 °C (thermocouple cold junction temperature compensation)
- additional caused by ambient temperature changes	< 0,003 % of input range /°C
<b>Resolution of measured temperature</b>	0,1 °C
<b>Display range (resolution of analog inputs)</b>	-1999 ÷ 9999, programmable
<b>Position of decimal point for analog inputs</b>	programmable, 0 ÷ 0,000
<b>Binary inputs</b> (contact or voltage <24V)	bistable, active level: short-circuit or < 0,8V
<b>Communication interface</b> (RS485 i PRG, do not use at the same time)	- RS485 (galvanically separated), option - PRG programming link (no separation), standard
	- bitrate 2,4 ÷ 115,2 kb/s, - format 8N1 (8 data bit, 1 bit stop, no parity bit), - MODBUS-RTU protocol (SLAVE)
<b>Outputs</b> (2 relays or SSR)	- relay (P1, P2), standard - SSR (SSR1, SSR2), option
	5A / 250Vac (for resistive loadsh), 1 main, 1 additional, SPST-NO transistor type NPN OC 24V, internal resistance 850 $\Omega$
<b>Analogue outputs</b> ( 1 current or voltage, without separation from input)	- current 0/4÷20 mA (standard) - voltage 0/2÷10 V (option) - output basic error
	maximum resolution 1,4 $\mu$ A (14 bit) output load $R_o < 500 \Omega$ maximum resolution 0,7 mV (14 bit) output load $I_o < 3,7$ mA ( $R_o > 2,7 k\Omega$ ) < 0,1 % of output range
<b>7-segment LCD display with brightness control</b>	4 digits, height 57 mm, 4 colors (red, orange, yellow, green)
<b>Signalling</b>	- relays active - messages and errors
	LED diode, 4 colors (as for display) LED dispaly
<b>Power supply (Usup)</b>	- 230Vac (standard) - 24Vac/dc (optional)
	85 ÷ 260 Vac/ 5VA 20 ÷ 50 Vac/ 5VA, 20 ÷ 72 Vdc/ 5W
<b>Power supply to filed transmitters</b>	24Vdc / 50mA
<b>Rated operating conditions</b>	0 ÷ 50°C, <100 %RH (non-condensing)
<b>Working environment</b>	air and neutral gases
<b>Protection rating</b>	IP65, industrial enclosure, wall mounting
<b>Weight</b>	~800g
<b>Electromagnetic compatibility (EMC)</b>	- immunity: acc. to PN-EN 61000-6-2 - emission: acc. to PN-EN 61000-6-4