



ULT21 - ULTRASONIC LEVEL TRANSDUCER

- Level measurement of liquid and powdery materials up to 10/15 m (depending on the version).
- Calculation of filling in the tank or flow in open channels.
- Standard galvanic separated analog output 0/4...20 mA.
- Digital interface RS-485 with Modbus RTU protocol.
- 2 alarm relays.
- Internal data and setup memory.
- Two 32-points individual characteristic (recalculate functions).



EXAMPLE OF APPLICATION

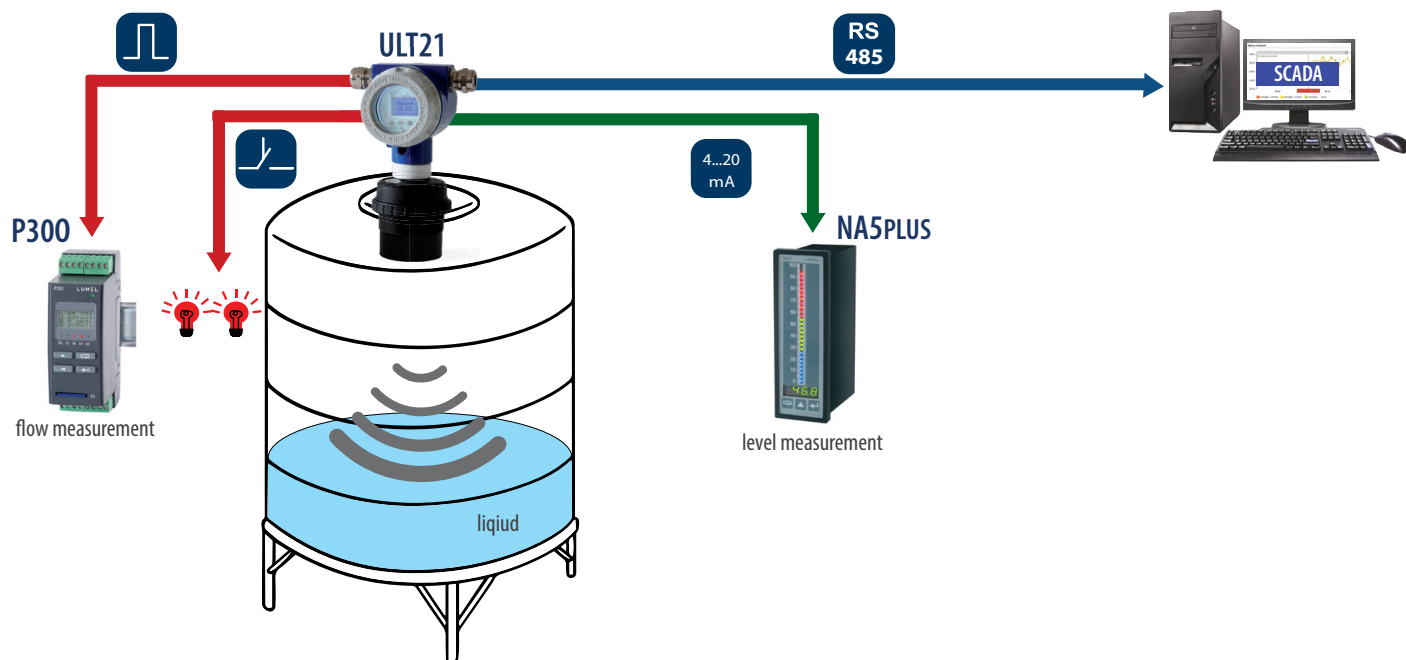


Fig.1. Level measurement with visualisation and recording.

FEATURES

- MOD BUS
- eCon software
- IP65 housing
- LCD Display
- Password protection
- IP66/68 sensor

INPUT

ultrasonic waves

OUTPUTS

- RS 485
- 0/4...20 mA
- USB

GALVANIC ISOLATION

TECHNICAL DATA

MEASUREMENT	
Range of distance measurement	0.5...10 m or 0.5...15 m (depending on the version, see comment below)
Beam width	12°
Ultrasound frequency	50 kHz
Measurement resolution	0.001 m
Measurement basic error	±1 % of the range

The **measuring range** is strongly dependent on the environment in which the measurements are made and the surface from which the ultrasonic wave is reflected. A typical reduction of the measuring range depending on the suppression of the ultrasonic wave is shown in Figure 2.

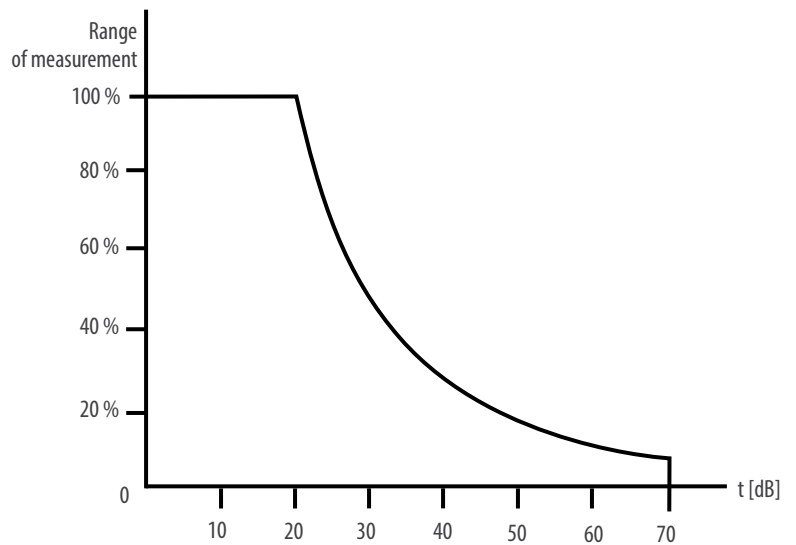


Fig. 2 Change of the measuring range r depending on the damping t of the measurement environment.

Typical damping for a given environment (reflective medium) is summarized in the table below.

FLUID		GRANULAR		DUST	
	Typical attenuation [dB]		Typical attenuation [dB]		Typical attenuation [dB]
Calm surface 	0	Hard, porous 	40	Low dust 	about 5
Wavy surface 	from 5 up to 10	Soft with strong damping (e.g. peat) 	from 40 up to 60	Large dust 	from 5 up to 20
Strong turbulence (agitators, etc.) 	from 10 up to 20				

OUTPUTS

Output type	Output signal	Maximum value at the output	Basic error	Error resulting from ambient temperature changes
analog	0/4...20 mA	24 mA	±0.2 % of the range	50 % of the basic error / 10K
Output type	Properties			
relay	2 NO outputs, maximum overload 100 mA / 300V a.c./d.c.			
pulse	NPN transistor, $U_{max} = 50\text{ V}$; $I_{max} = 50\text{ mA}$, $R_s = 100\ \Omega$			

DIGITAL INTERFACES

Interface type	Properties
RS-485	Modbus RTU: 8N2, 8E1, 8O1, 8N1; baud rate 9600...115200 bit/s
USB	USB Device, v.2.0

RATED OPERATING CONDITIONS

Supply voltage	12...24...40 V d.c.
Power consumption	< 4W
Operating temperature	-20...23...55 °C (do not expose the transducer to direct sunlight)
Storage temperature	-25...70 °C
Humidity	< 95% (water vapor condensation is not permissible)
Operating position	any

SAFETY AND COMPABILITY REQUIREMENTS

Electromagnetic compatibility	noise immunity	acc. to EN 61000-6-2
	noise emissions	acc. to EN 61000-6-4
Isolation between circuits	basic	acc. to EN 61010-1
Pollution level	2	acc. to EN 61010-1
Installation category	III	acc. to EN 61010-1
Maximal phase-to-earth voltage	<ul style="list-style-type: none"> 50 V (all circuits apart from alarm circuits), 300 V for alarm circuits 	acc. to EN 61010-1
Altitude a.s.l.	< 2000 m	

EXTERNAL FEATURES

Protection grade	housing: IP65 acc. to EN 60529	sensor: IP66 or IP68 (acc. to ordering code) acc. to EN 60529
Weight	1.4 kg	
External dimensions	acc. to fig.3	

EXTERNAL DIMENSIONS

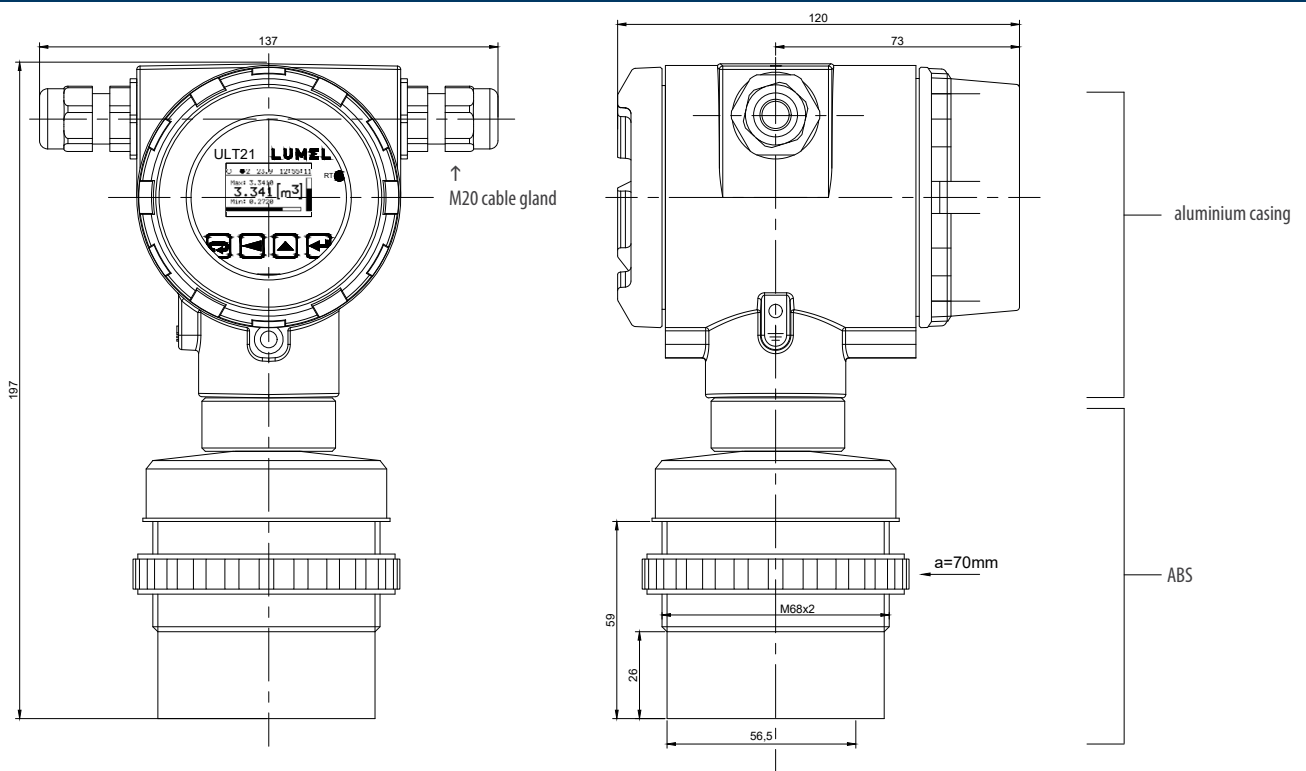
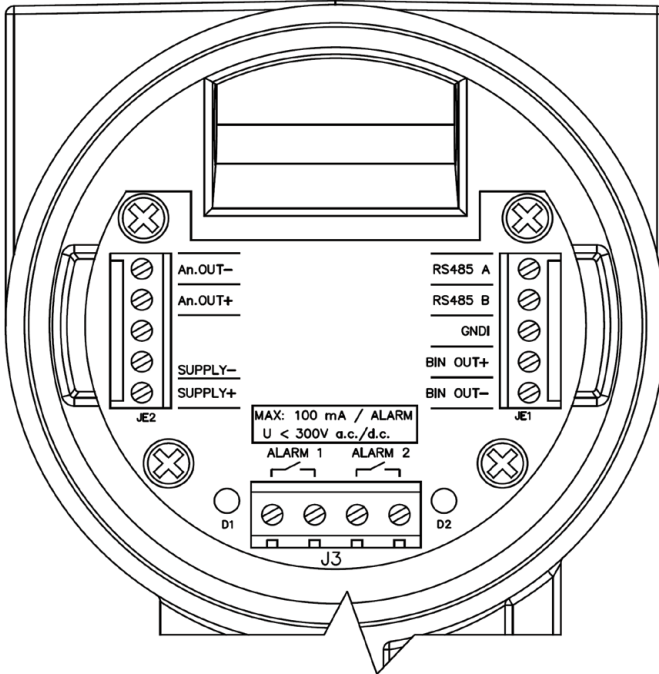


Fig.3. External dimensions of ULT21.

CONNECTION DIAGRAMS



Signal	Description
An.Out+, An.Out	Analog output: 0/4..20 mA.
SUPPLY+, SUPPLY-	Supply 12..40 V d.c.
RS485_A, RS485_B, GNDI	Interface RS485
BIN OUT+, BIN OUT-	Binary pulse output
ALARM 1	Relay output no. 1
ALARM 2	Relay output no. 2

ORDERING CODE

ULT21		X	XX	X	X
Measurement range / Protection grade for sensor:					
0.5...10 m	IP66	1			
	IP68	2			
0.5...15 m	IP66	3			
	IP68	4			
Version:					
standard			00		
custom-made*			XX		
Language:					
Polish/ English				M	
other*				X	
Acceptance tests:					
without additional quality requirements					0
with an extra quality inspection certificate					1
acc.to customer's request*					X

Order example:

The code: **ULT21 1 00 M 0** means:

ULT21- ultrasonic level transducer ULT21

1 - measurement range: 0.5...10 m, protection grade for sensor: IP66

00 - standard version

M - user's manual in Polish/English

0 - without additional quality requirements.

* only after agreeing with the manufacturer

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