Dinel®

Adress	Adress [hex]	Data type	Read/ Write	Register Name	Note
Commands type 16-bit Integer (measuring value + info)					
100	0x64	Word	R	DISTANCE [mm]	Distance level from level meter [mm]
101	0x65	Word	R	LEVEL [mm]	Height of measured level from lower level set [mm]
102	0x66	Word	R	PERCENTAGE	Percentage level (between low and high level setting)
103	0x67	Signed Word	R	TEMPERATURE [°C]	Temperature in tank [°C]
104	0x68	Word	R	STATUS1 ECHO – OK LEVEL HIGH LEVEL LOW	Last measuring state Bit 0 =1 ECHO captured in the last measurement Bit 1 =1 Level is above to measurement range or in the dead zone Bit 2 =1 Level is below to measurement range
105	0x69	Word	R	RANGE [mm]	Maximum measuring range [mm] – see "Technical data" table
106	0x6A	Word	R	DEAD ZONE [mm]	Dead zone [mm] (minimum measuring range) – see "Technical data" table
107	0x6B	Word	R	ID (Sensor Type)	Identification number
108	0x6C	Word	R	Serial No. – MSB	Serial number – upper byte
109	0x6D	Word	R	Serial No. – LSB	Serial number – lower byte
110	0x6E	Word	R	Firmware No.	xy format (e.g. 10=1.0)
Commands type 16-bit Integer (level meter setting)					
200	0xC8	Word	R/W	LEVEL MIN [mm]	Lower level measuring setting (Distance from level meter in [mm]) see Fig.1
201	0xC9	Word	R/W	LEVEL MAX [mm]	Upper level measuring setting (Distance from level meter in [mm]) see Fig.1
202	0xCA	Word	R/W	AVERAGE	Average of last N measuring – from 1 to 20 measuring (With extreme elimination 1 – 18); DEFAULT=4
203	0xCB	Word	R/W	STATUS2 EXTREME MIN+MAX MEDIUM COMP FACTORY DEFAULT RESET	Measurement settings Bit 0 =1 Deleting of MIN and MAX extreme values from last N measuring – see AVERAGE Bit 1 =1 Next temperature correction with respect to a specified medium temperature – see MEDIUM TEMPERATURE (204) [1] Bit 2 =1 FACTORY DEFAULT start (Default factory setting without MODBUS settings) Bit 3 =1 RESET level meter
204	0xCC	Signed Word	R/W	MEDIUM TEMPERATURE [°C]	Media temperature set in tank [°C] (-99°C ... +99°C)
205	0xCD	Word	R/W	LEVEL UNIT	Level units – for command type IEEE754 (from address 300 and more) [2]
206	0xCE	Word	R/W	QUANTITY UNIT	Quantity units – for command type IEEE754 (from address 300 and more) [2]
207	0xCF	Word	R/W	TEMPERATURE UNIT	Temperature units – for command type IEEE754 (from address 300 and more) [2]
208	0xD0	Word	R/W	MEAS PER SEC	Number of measurements per second (Var. 02; 06: 1–5, Var. 10: 1–2, Var. 20: 1), DEFAULT=1
209	0xD1	Word	R/W	MODBUS ADRESS	MODBUS address (1 – 247), DEFAULT=1 ; after registration, device responding to old address
210	0xD2	Word	R/W	MODBUS BAUDRATE	Baudrate (4800, 9600, 19200), DEFAULT=9600; after registr., device responding to new baudrate
211	0xD3	Word	R/W	MODBUS PARITY	Parity (0 = NONE+1STOPBIT, 1 = ODD, 2 = EVEN, 3 = NONE+2STOPBIT), DEFAULT=0 ; after registration, device responding to new parity
Commands type 32-bit Floating point (measuring value)					
300	0x12C	DWord	R	DISTANCE IEEE754	Distance level from level meter – see LEVEL UNIT (205)
302	0x12E	DWord	R	LEVEL IEEE754	Height of measured level from lower level set – see LEVEL UNIT (205)
304	0x130	DWord	R	QUANTITY IEEE754	Quantity of the tank – see QUANTITY UNIT (206)
306	0x132	DWord	R	PERCENTAGE IEEE754	Percentage level (between low and high level setting)
308	0x134	DWord	R	TEMPERATURE IEEE754	Temperature in tank – see TEMPERATURE UNIT (207)
310	0x136	DWord	R	RANGE IEEE754	Maximum measuring range [3] – see LEVEL UNIT (205)
312	0x138	DWord	R	DEAD ZONE IEEE754	Dead zone [mm] (minimum measuring range) [3] – see LEVEL UNIT (205)
Commands type 32-bit Floating point (level meter setting)					
400	0x190	DWord	R/W	LEVEL MIN IEEE754	Lower level measuring setting (Distance from level meter) – see Fig.1 and LEVEL UNIT (205)
402	0x192	DWord	R/W	LEVEL MAX IEEE754	Upper level measuring setting (Distance from level meter) – see Fig.1 and LEVEL UNIT (205)
404	0x194	DWord	R/W	QUANTITY MIN IEEE754	Min. media quantity set in tank (adequate LEVEL MIN) – see Fig.1 and QUANTITY UNIT (206)
406	0x196	DWord	R/W	QUANTITY MAX IEEE754	Max. media quantity set in tank (adequate LEVEL MAX) – see Fig.1 and QUANTITY UNIT (206)
408	0x198	DWord	R/W	MEDIUM TEMPERATURE IEEE754	Media temperature set in tank – see TEMPERATURE UNIT (207) (-99°C ... +99°C; -210°F ... +210°F)

1) If in the tank is a big difference between the temperature of the measured medium and temperature in the place of installation of the ULM.
The level meter then calculates the average value from the medium temperature and the temperature at the installation place of the level meter.
2) See "Units table".
3) See level meter technical data.

ADDITIONAL TECHNICAL DATA ULM–53L Modbus	
Communication protocol	Galvanic separation RS–485 without 120 Ω termination resistor, MODBUS RTU (Slave)
Specification	MODBUS over serial line specification and implementation guide v1.02; MODBUS application protocol specification v1.1b
Support commands	03 (0x03h), 06 (0x06h), 16 (0x10h)
Broadcast	YES
Data	Save in holding registers
Data format	WORD (16- bit Integer, Transfer No.: HIGH byte, LOW byte) DWORD (32-bit Floating point IEEE754, Transfer No.: Sign+Eponent, Exponent+Mantisa(high), Mantisa, Mantisa(low)
Baud rate	4800, 9600, 19200 (default value – 9600)
Data	8 bits
Parity	NONE+1STOPBIT, ODD, EVEN, NONE+2STOPBIT (default value = NONE+1STOPBIT)
Address	1 – 247 (default value – 1)

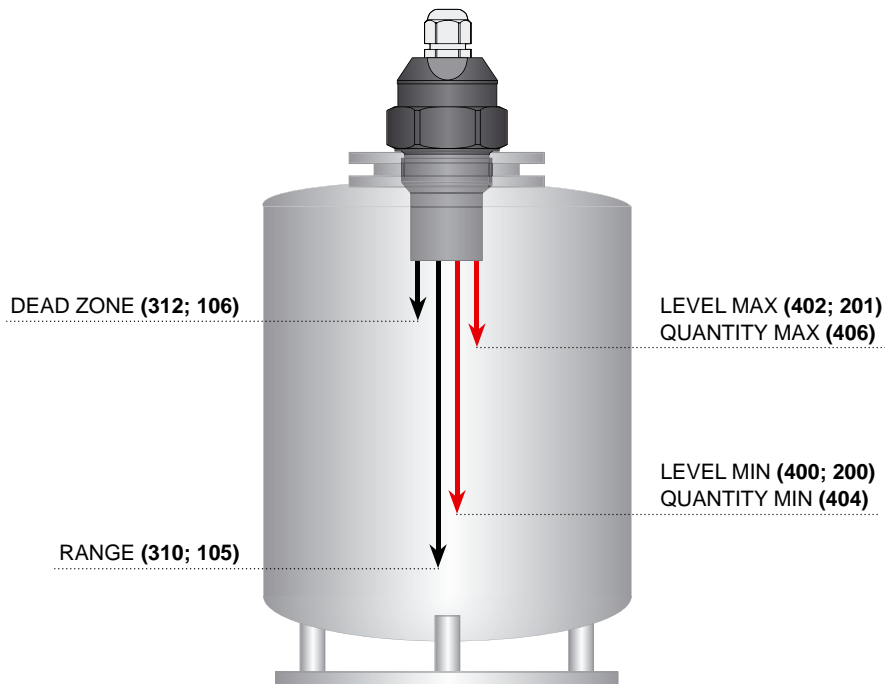| UNITS TABLE ULM–53L Modbus	
For LEVEL UNIT	44 (ft); 45 (m); 47 (in); 48 (cm); 49 (mm)
For QUANTITY UNIT	40 (gal); 41 (liter); 43 (m³); 44 (ft); 45 (m); 46 (bbl); 47 (in); 48 (cm); 49 (mm); 57 (%); 236 (hl)
For TEMPERATURE UNIT	32 (°C), 33 (°F)

Fig. 1: Basic level meter commands

The freeware **Basic Scada system** software for level meter settings and communications is available after purchasing.

Downolad this software from Dinel website (version for WinXP, 2000, Vista, 7, 8):